

--PRIOR ART--

FIGURE 2

The diagram illustrates the structure of a PES (Program Element Stream) packet, divided into three main sections: PES packet header, PES packet data, and PES private data.

PES packet header: This section includes the following fields:

- packet start code prefix (24 bits)
- stream id (8 bits)
- PES packet length (16 bits)
- optional PES header (hatched area)
- stuffing bytes (FF) (M*8 bits)
- PES packet data bytes

PES packet data: This section includes the following fields:

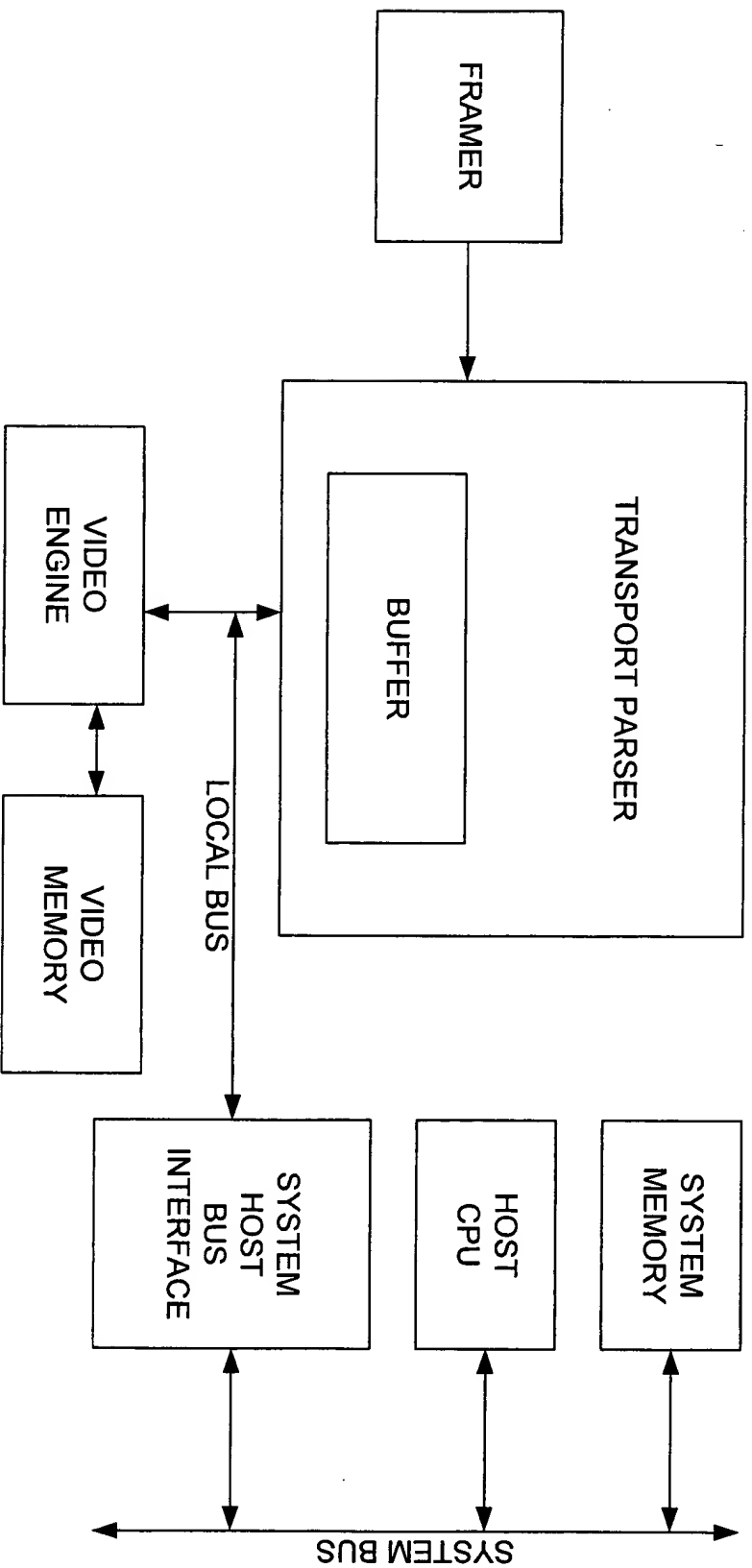
- PES scrambling control (2 bits)
- PES priority (2 bits)
- PES priority (1 bit)
- data alignment indicator (1 bit)
- copyright (1 bit)
- original or copy (1 bit)
- 7 flags (7 bits)
- PES header data length (8 bits)
- optional fields (hatched area)

PES private data: This section includes the following fields:

- PTS DTS (33 bits)
- ESCR (33+9 bits)
- ES rate (22 bits)
- DSM trick mode (8 bits)
- additional copy info
- PES CRC (16 bits)
- PES extension (hatched area)

The diagram also shows a detailed view of the PES private data fields, including the PES CRC and PES extension fields.

FIGURE 3



-- PRIOR ART --
FIGURE 4

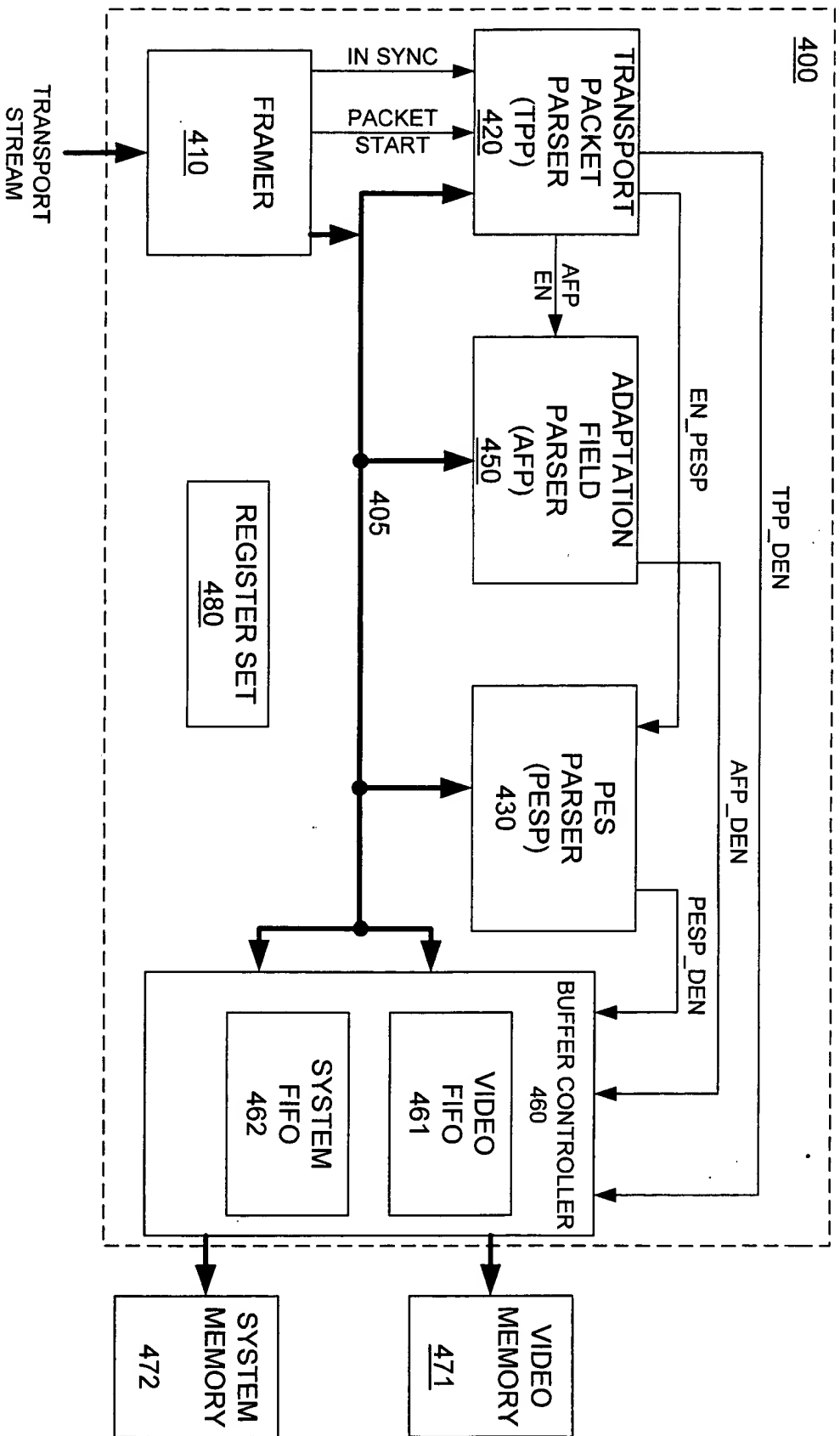


FIGURE 5

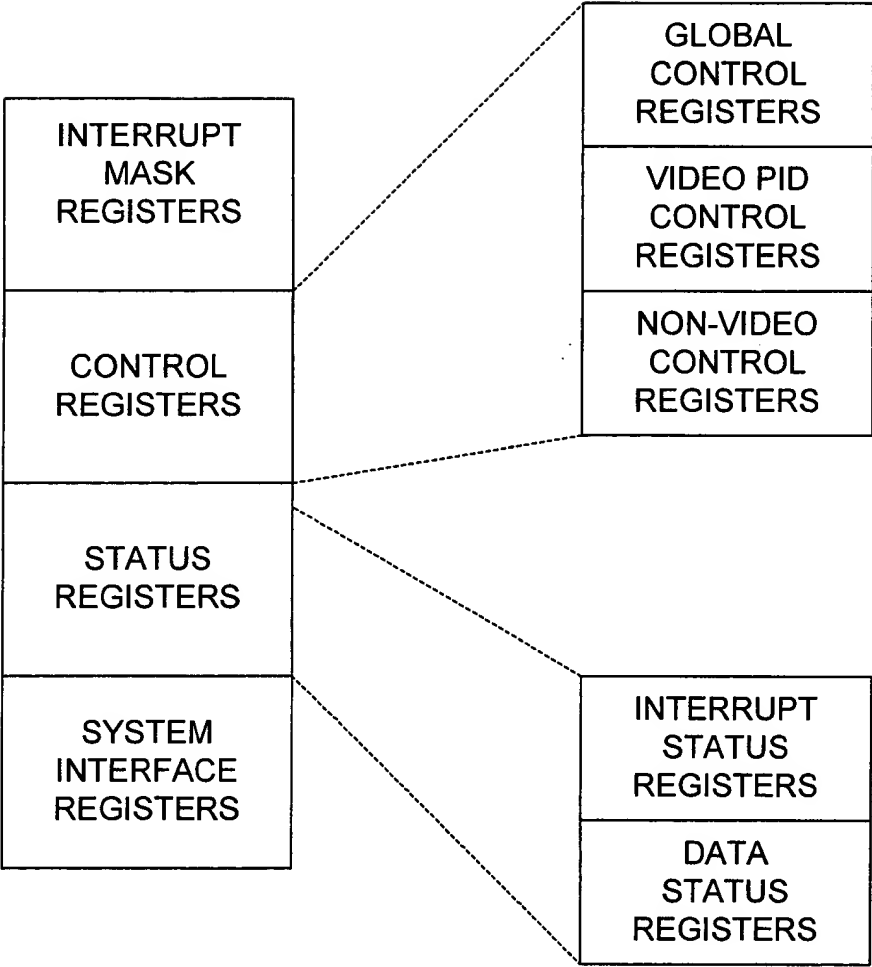


FIGURE 6

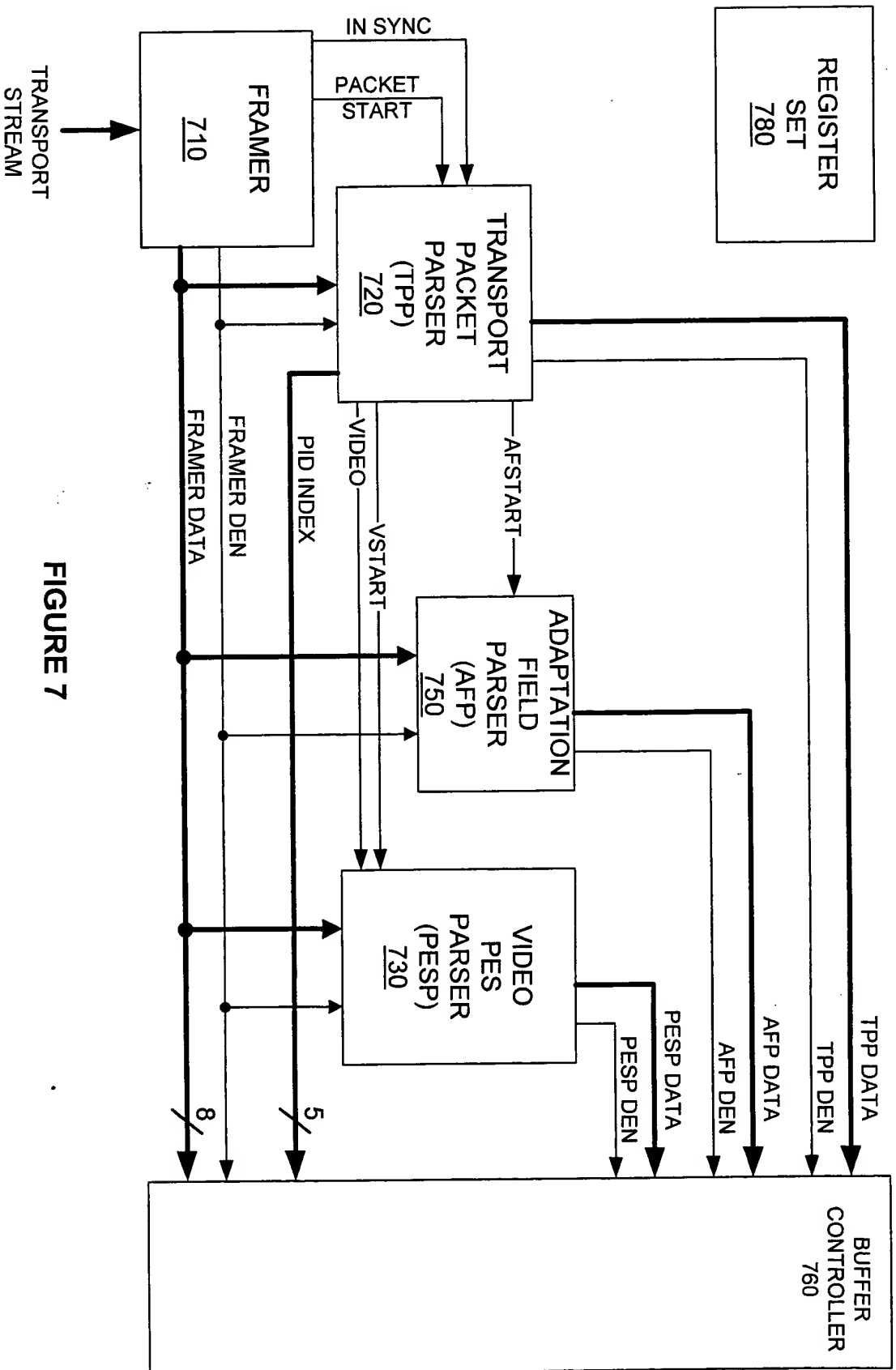


FIGURE 7

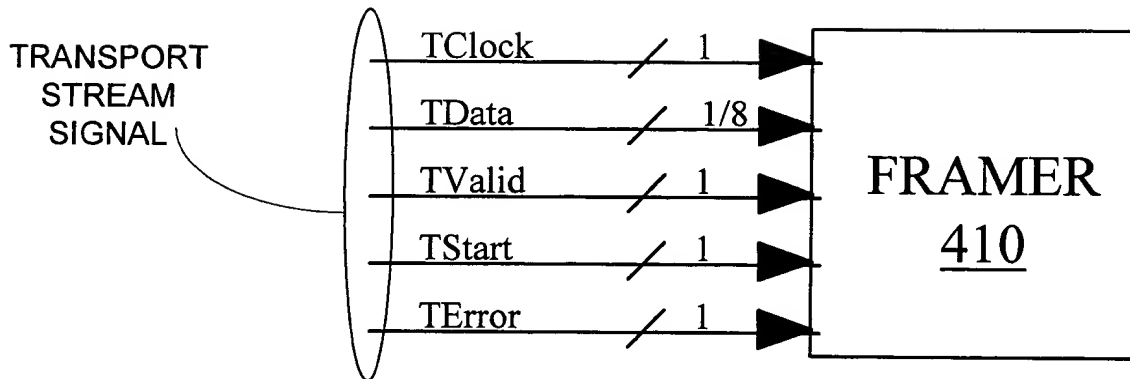


FIGURE 8

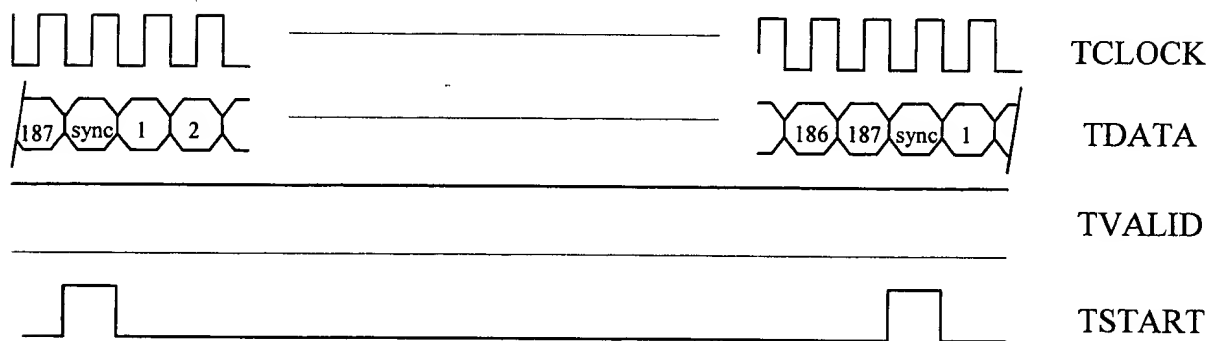


FIGURE 9

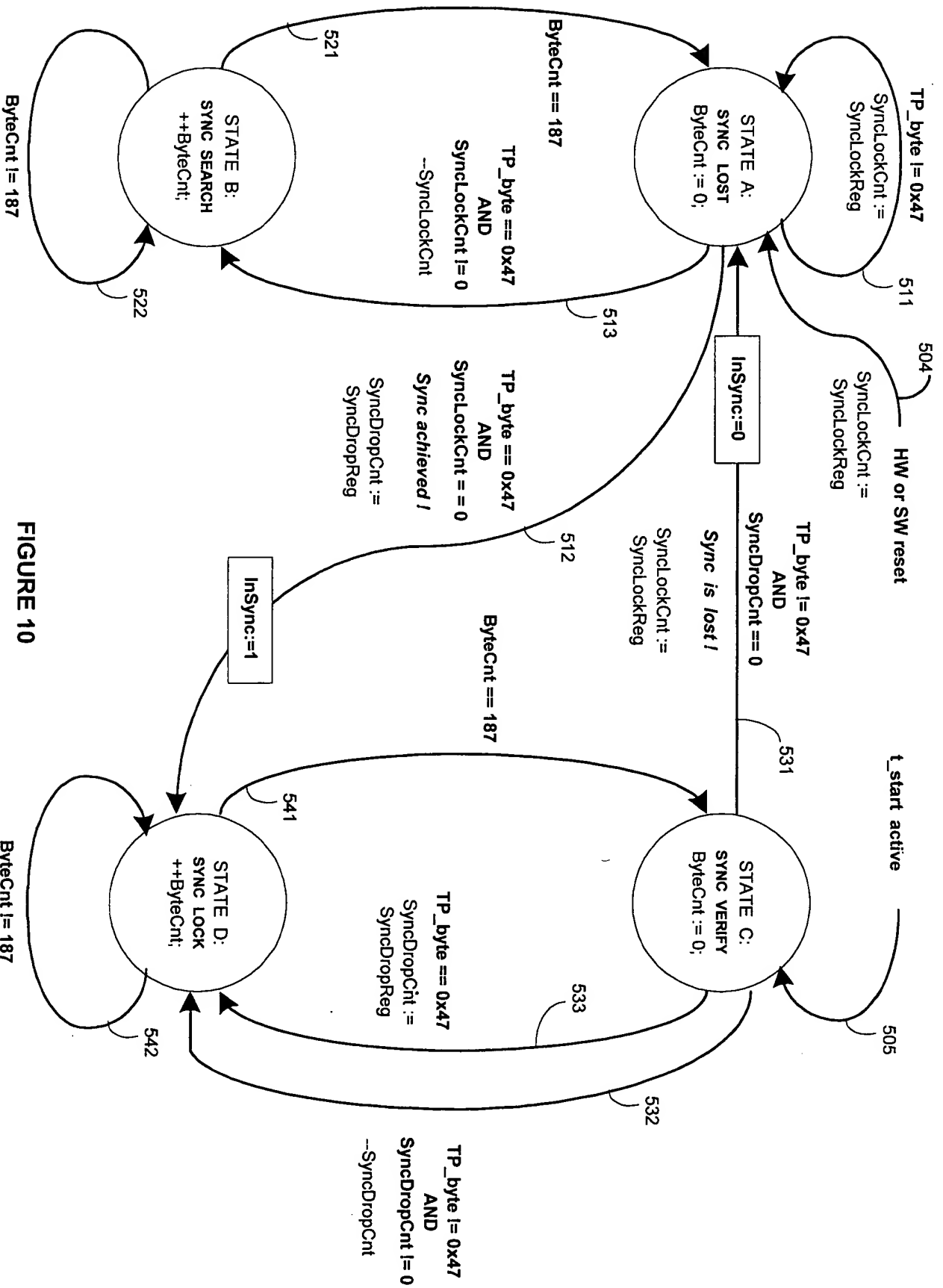


FIGURE 10

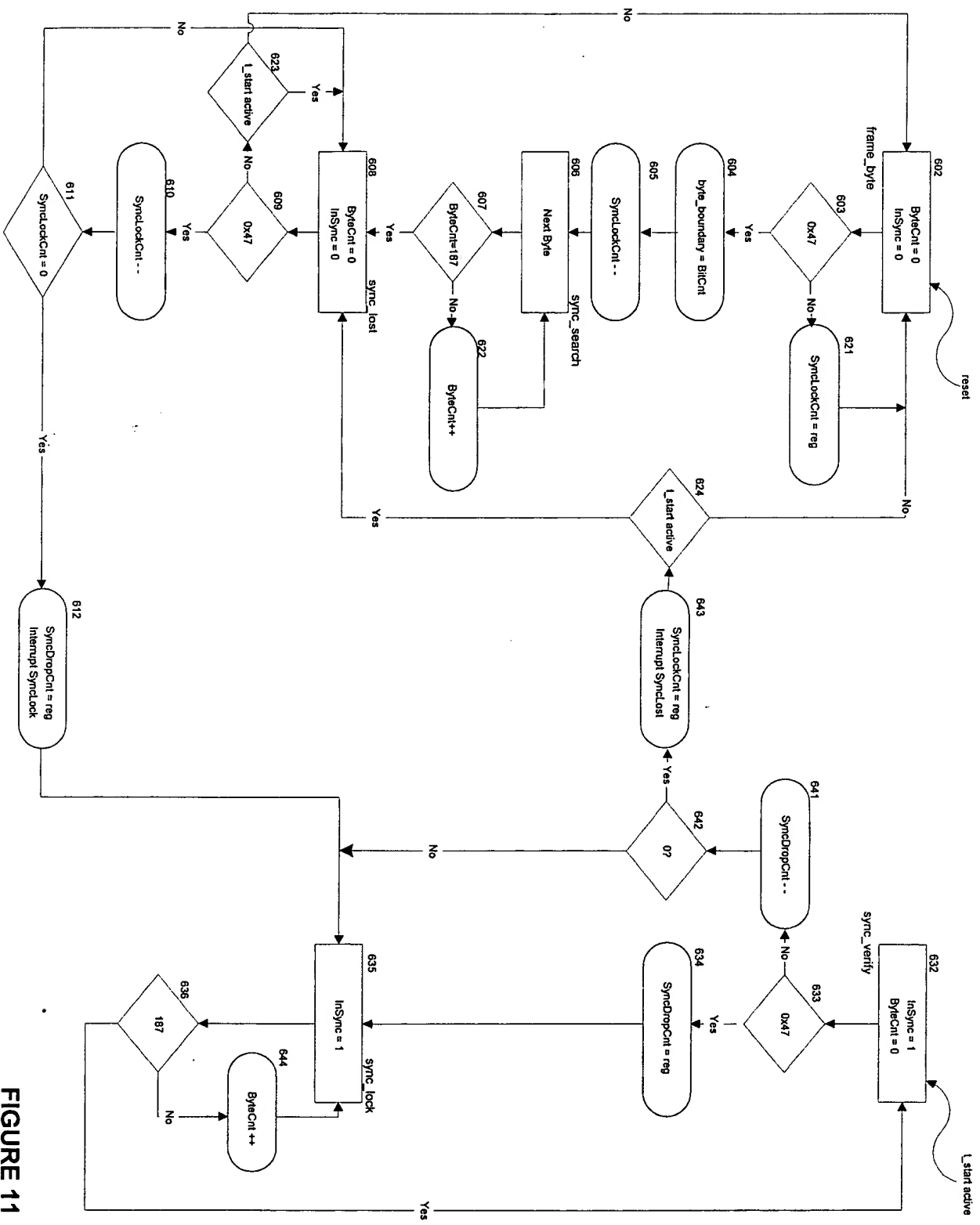


FIGURE 11

Copyright 2000 by Intel Corporation

Transport Demultiplexer Global Control Register					
Field Name	Bits	Len	Default	Type	Description
FramerSyncLockLength	0-4	[5]	00101	R/W	Five bits field to select a number of consecutive transport packets after MPEG-2 frame (bit-stream) synchronization is declared.
FramerSyncDropLength	5-7	[3]	011	R/W	Three bits field to select a number of consecutive transport packets after a loss of MPEG-2 frame synchronization is declared.
FramerBitPolarity	8	[1]	0	R/W	'0' selects msb first (default mode), '1' select lsb first
FramerClockPolarity	9	[1]	0	R/W	If set to '0' framer will latch on falling edge (default) If set to '1' framer will latch on rising edge.
FramerMode:	10-11	[2]	'00'	R/W	Defines a combination of external control signals: '00' – Framer uses T_start only. '01' – Framer uses T_valid only. '10' – Framer uses T_start and T_valid. '11' – Framer uses T_clock and T_data only.
Other Functionality Bits	12-15	[4]			Other functionality (not relevant to Framer)
T_ValidPolarity	16	[1]	1	R/W	'1' selects active high [5V] for t_valid external signal
T_StartPolarity	17	[1]	1	R/W	'1' selects active high [5V] for t_start external signal
T_ErrorPolarity	18	[1]	1	R/W	'1' selects active high [5V] for t_error external signal
Other Functionality Bits	19-28	[10]			Other functionality (not relevant to Framer)
UnusedField	29 -31	[3]	0	R/W	Unused and reserved field. Always set to 0.

FIGURE 14

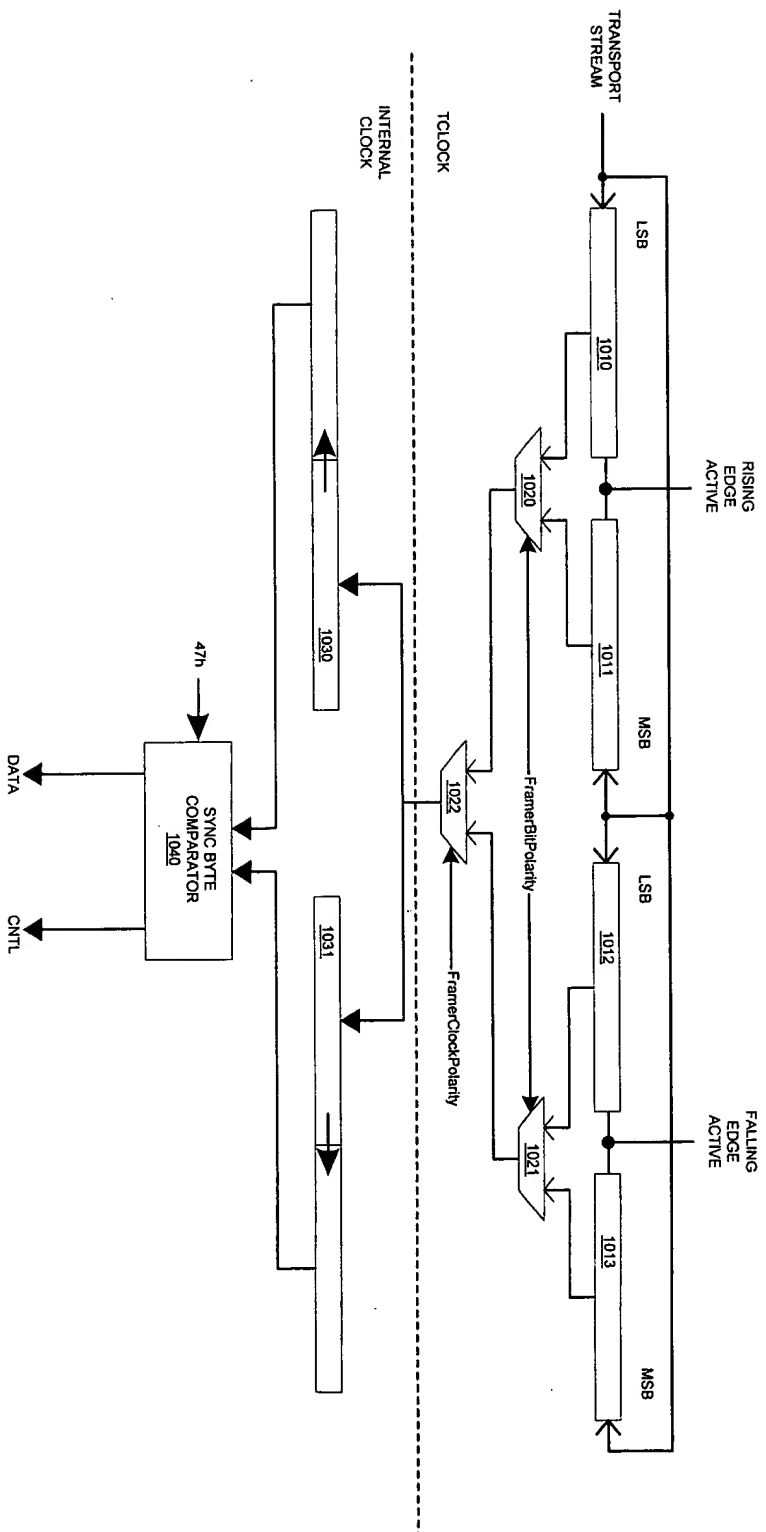


FIGURE 15

720

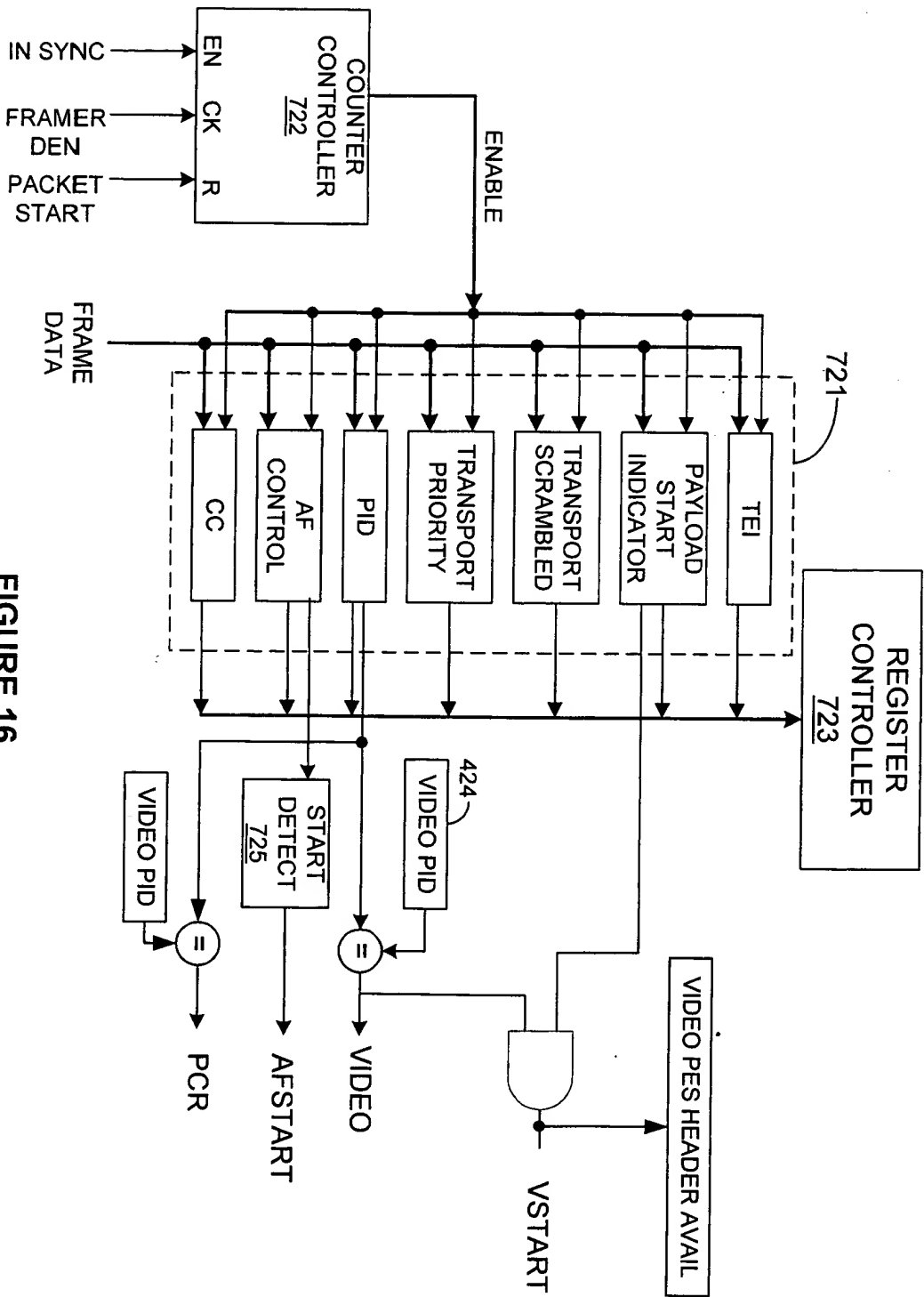


FIGURE 16

09463639 v.0.1.0.0

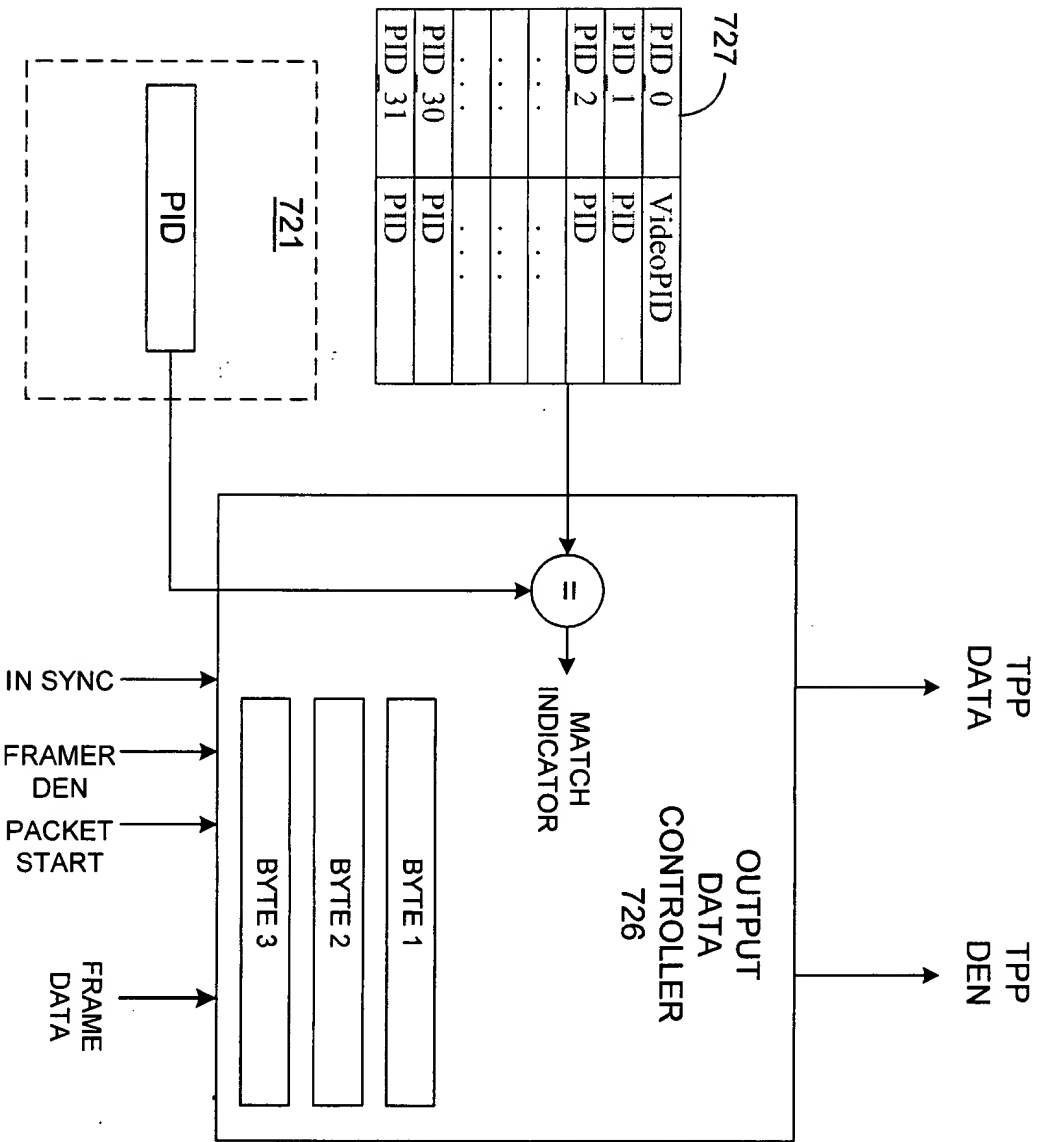


FIGURE 17

Video Control Registers					
Field Name	Bits	Len	Default	Type	Description
VideoPid	0-12	[13]	0x1FFF	R/W	Selects a specific PID of the video component stream to filter on. Value of 4095 is reserved one (it means a NULL transport packets).
EnableParsing	13	[1]	0	R/W	If '1' enables parsing from the next transport packet.
StartFromPUSICommand	14	[1]	0	R/W	'0' enables PES parsing immediately. '1' enables PES parsing a transport packet from new PES packet. After that, this bit auto-returns to 0.
ProcessStreamID	15	[1]	0	R/W	If '1' enables parsing on specific stream_id field.
StreamID	16-23	[8]	0xE0	R/W	stream_id of the ES stream to filter on in the PESP.

FIGURE 18

Transport Demultiplexer Registers						
Field Name		Bits	Len	Default	Type	Description
PID_yz, 0 ≤ yz ≤ 30		0-12	[13]	0x1FFF	R/W	Selects a specific PID of the component stream to filter on. Value of 0x1FFF is reserved (it means a NULL transport packets).
EnableParsing		13	[1]	0	R/W	If set to '1' extraction of defined PID yz is enabled.
BufferIndex		14-17	[4]	0	R/W	Specifies 1 of 16 destination buffers in the sys. mem.

FIGURE 19

0442063460

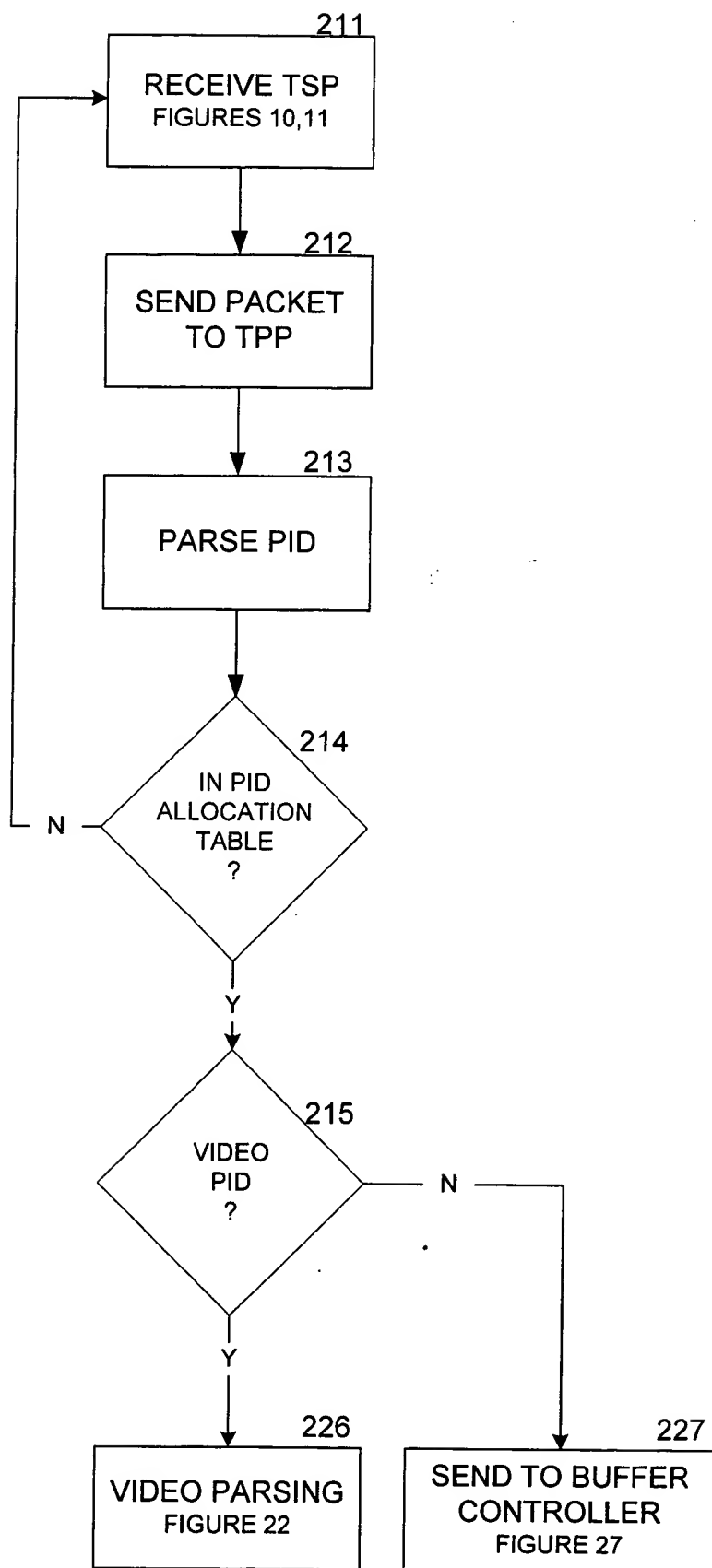


FIGURE 20

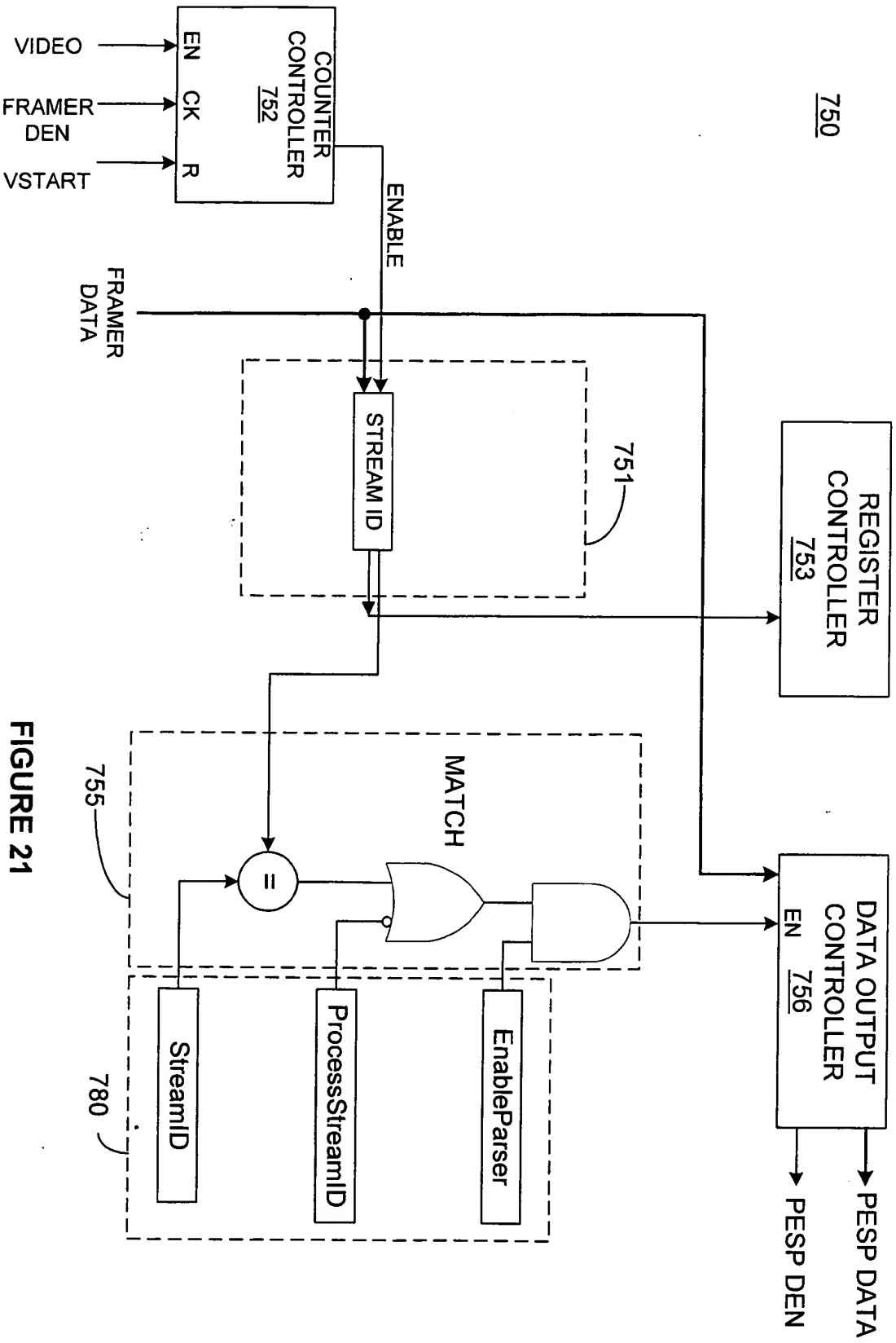


FIGURE 21

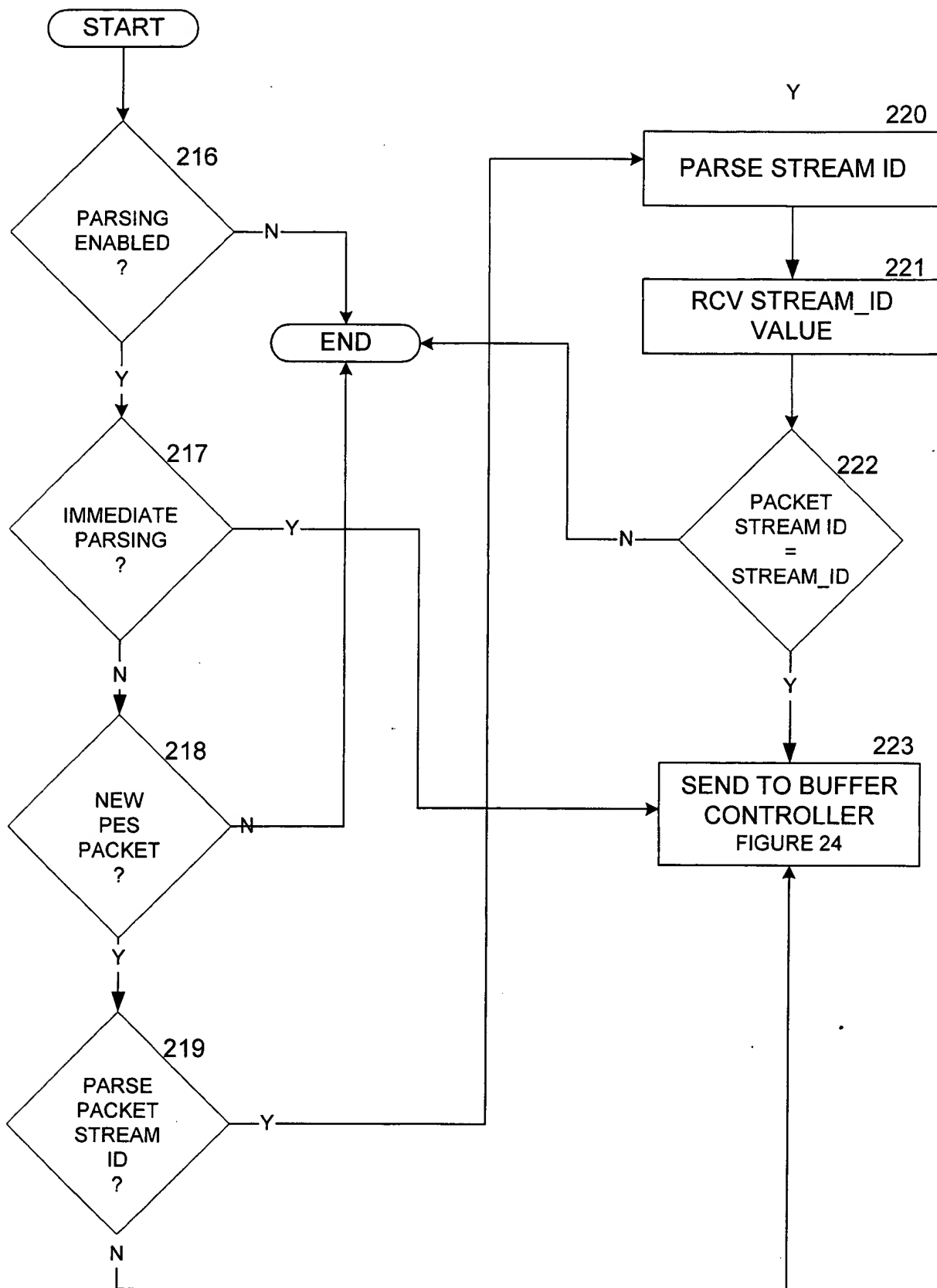


FIGURE 22

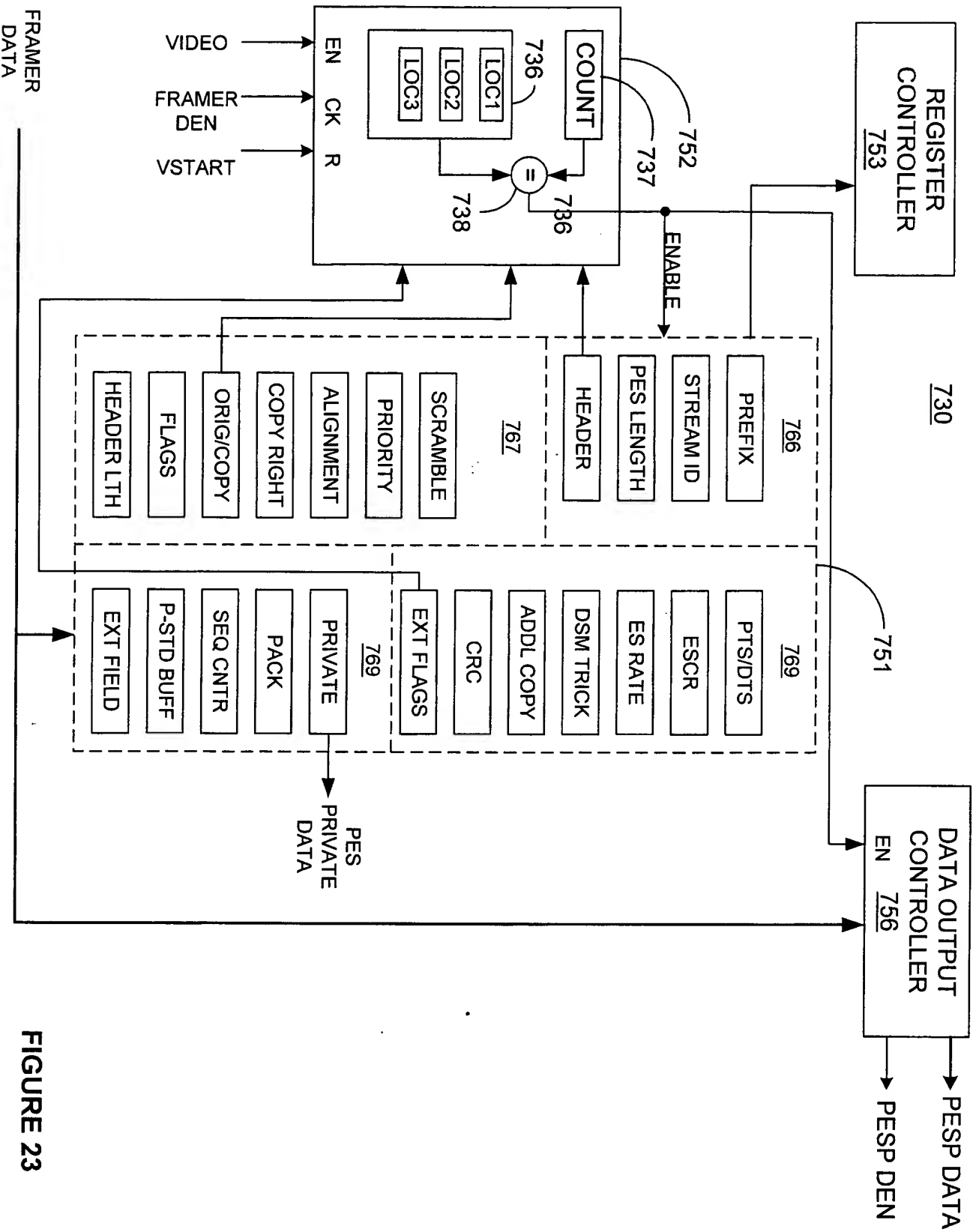


FIGURE 23

Transport Demultiplexer Global Status Register					
Field Name	Bits	Len	Default	Type	Description
VideoPESHeaderAvailable	12	[1]	0	R/W	This bit is set to '1' when the new PES header of the video stream is received. WR ACC CLEAR.
VideoPESHeaderError	13	[1]	0	R/W	This bit is set to '1' after an error in the PES header is found. WR ACC CLEAR.
VideoPESDataAlignment	14	[1]	0	R/W	This bit is set to '1' when video PID has AF <i>data_alignment_flag</i> , indicating a possible start of I frame. WR ACC CLEAR.
VideoPESDSMTrickMode	15	[1]	0	R/W	Indicates that DSM data is found and extracted. WR ACC CLEAR.
VideoPESPrivateData	16	[1]	0	R/W	This bit is set to '1' when video PID has 16 bytes of private data in the PES header. WR ACC CLEAR.
VideoPESCRCErrors	17	[1]	0	R/W	This bit is set to '1' if the video CRC of the PES parser found a CRC mismatch. WR ACC CLEAR.

Figure 24

Transport Demultiplexer Interrupt Mask Register					
Field Name	Bits	Len	Default	Type	Description
EventInterruptMask	0-18	[19]	0	R/W	If set to '1' enables local sources Bit 12 – VideoPESHeaderAvailable Bit 13 – VideoPESHeaderError Bit 14 – VideoPESDataAlignment Bit 15 – VideoPESDSMTrickMode Bit 16 – VideoPESPrivateData Bit 17 – VideoPESCRCErrors Bit 18 – VideoPTSReceived Bit 19 – VideoESCRReceived

Figure 25

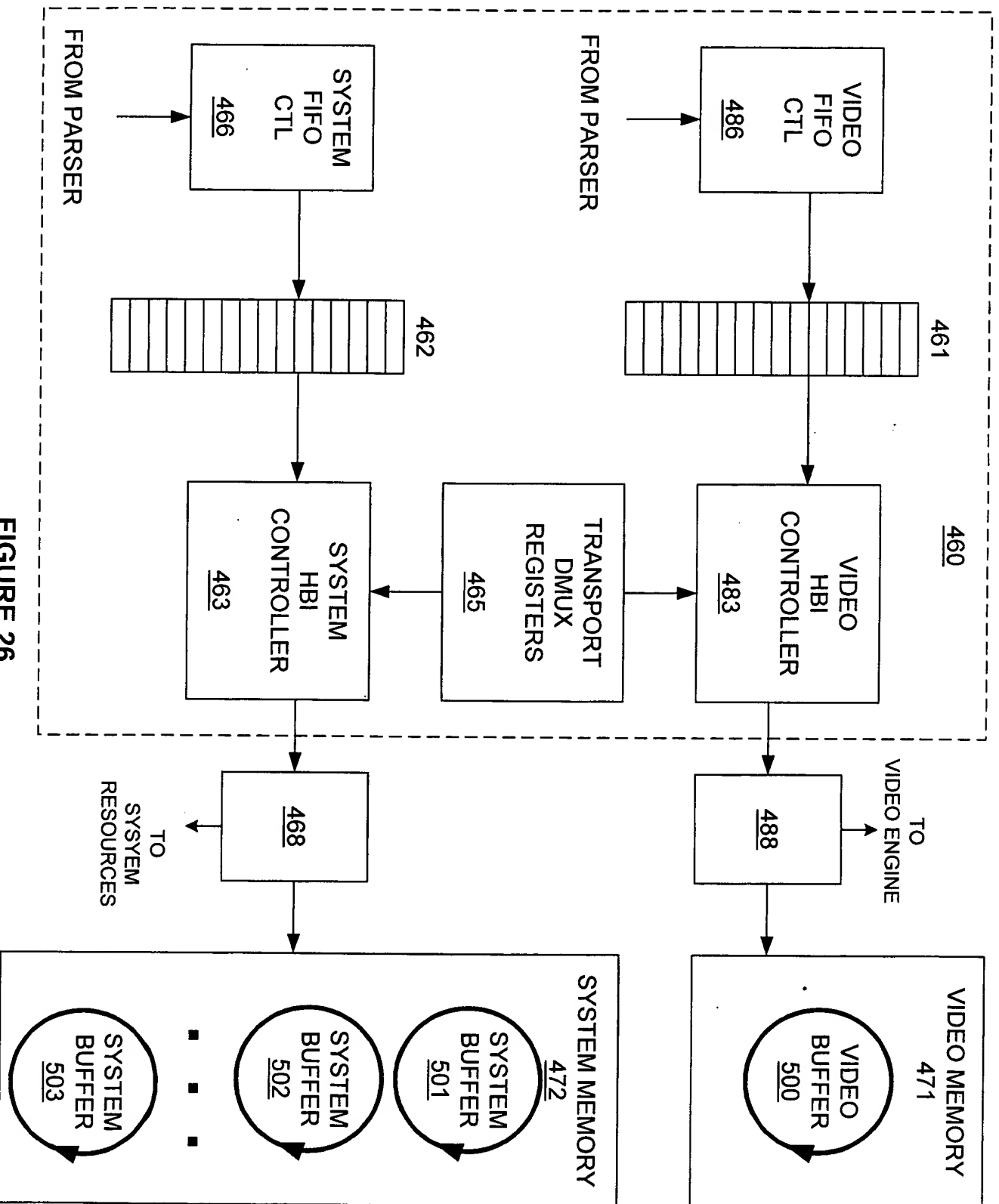


FIGURE 26

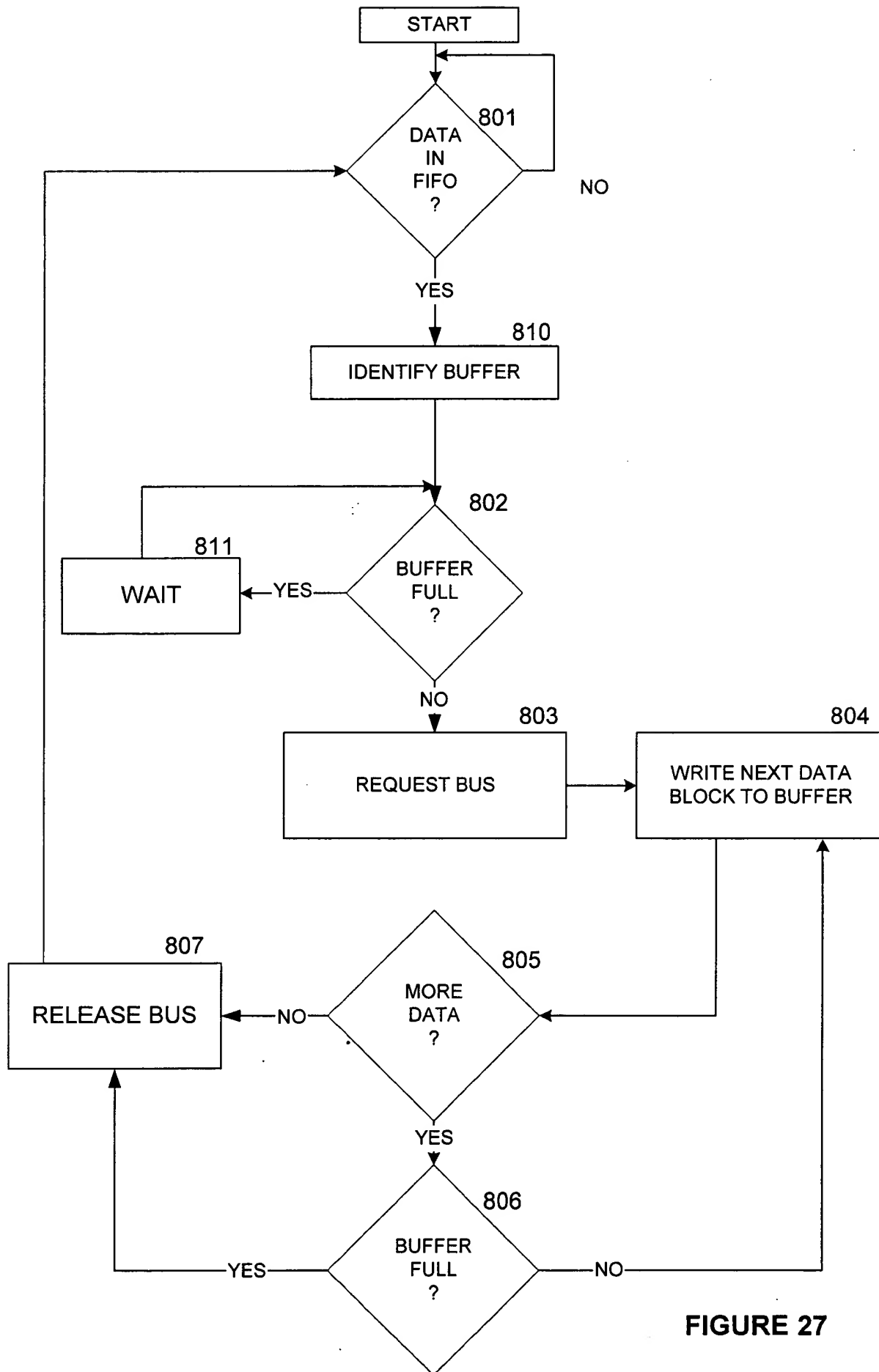


FIGURE 27

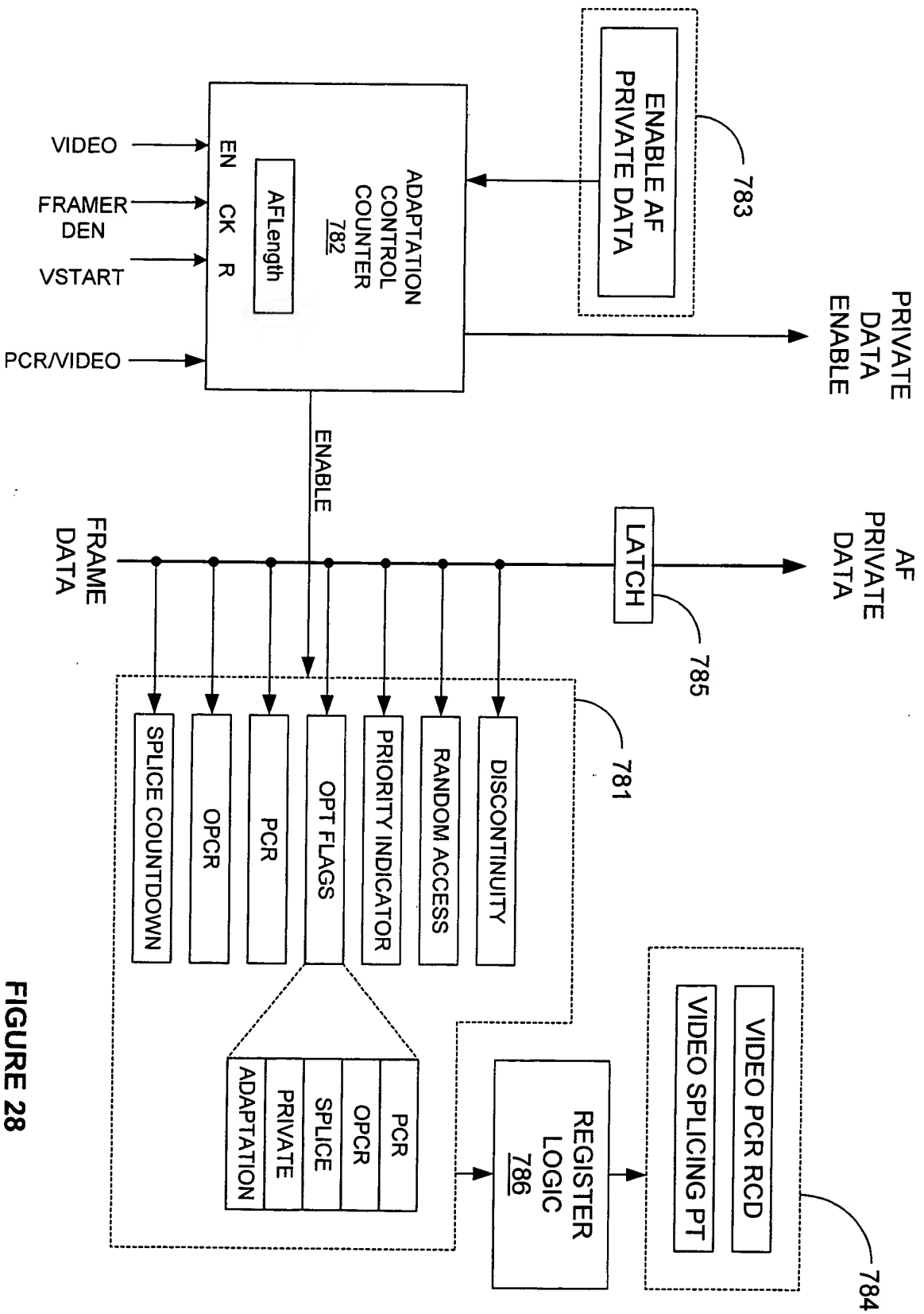


FIGURE 28

Figure 29

Figure 30

Transport Demultiplexer Global Control Register				
Field Name	Bits	Len	Default	Type
EnableAFPrivateData	[1]	0		R/W
AFPrivateDataBufferIndex	[4]	0		R/W
PCRIndex	[1]	0		R/W
EnableAutoSplicing	[1]	0		R/W

Figure 31

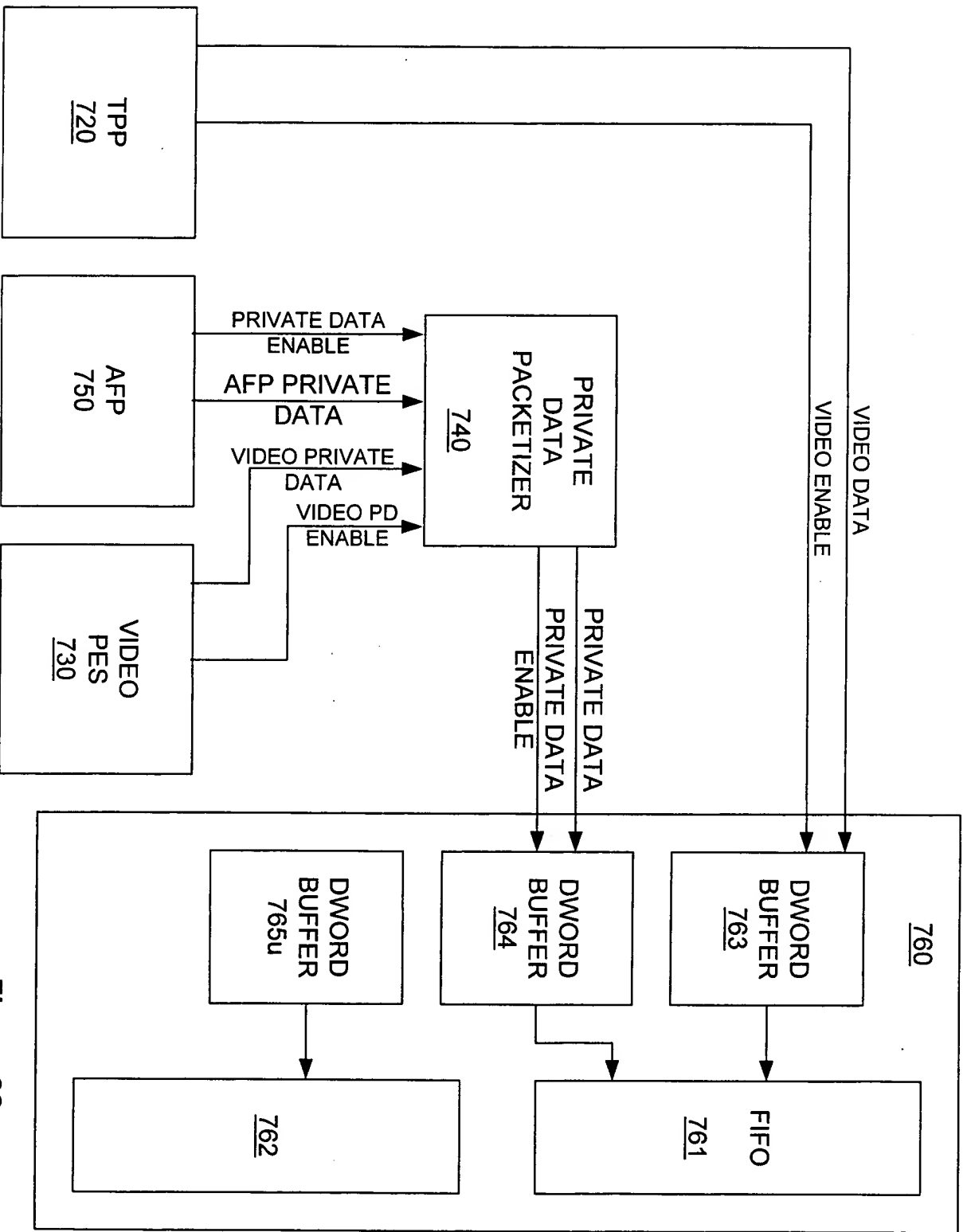


Figure 32

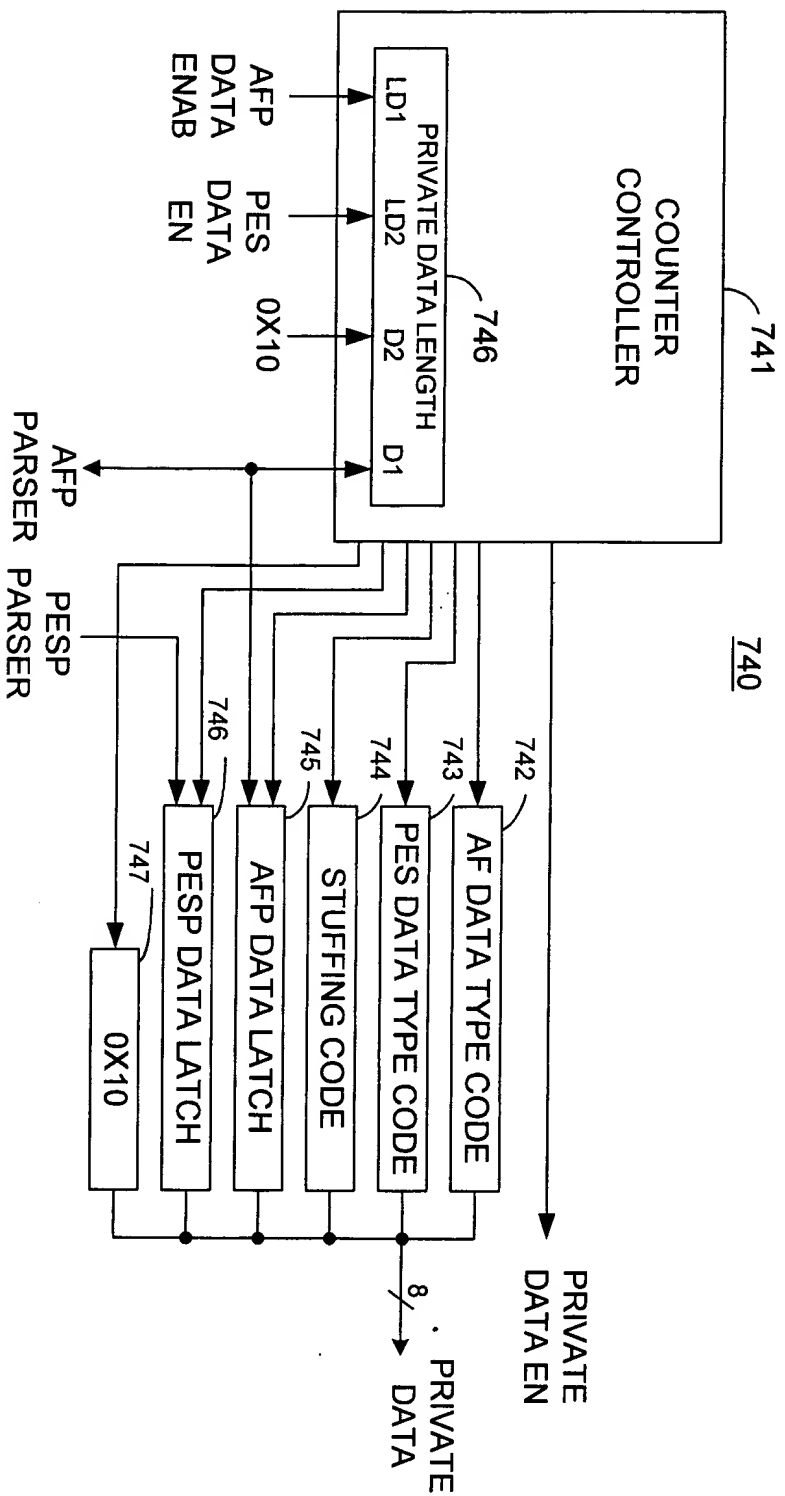


Figure 33

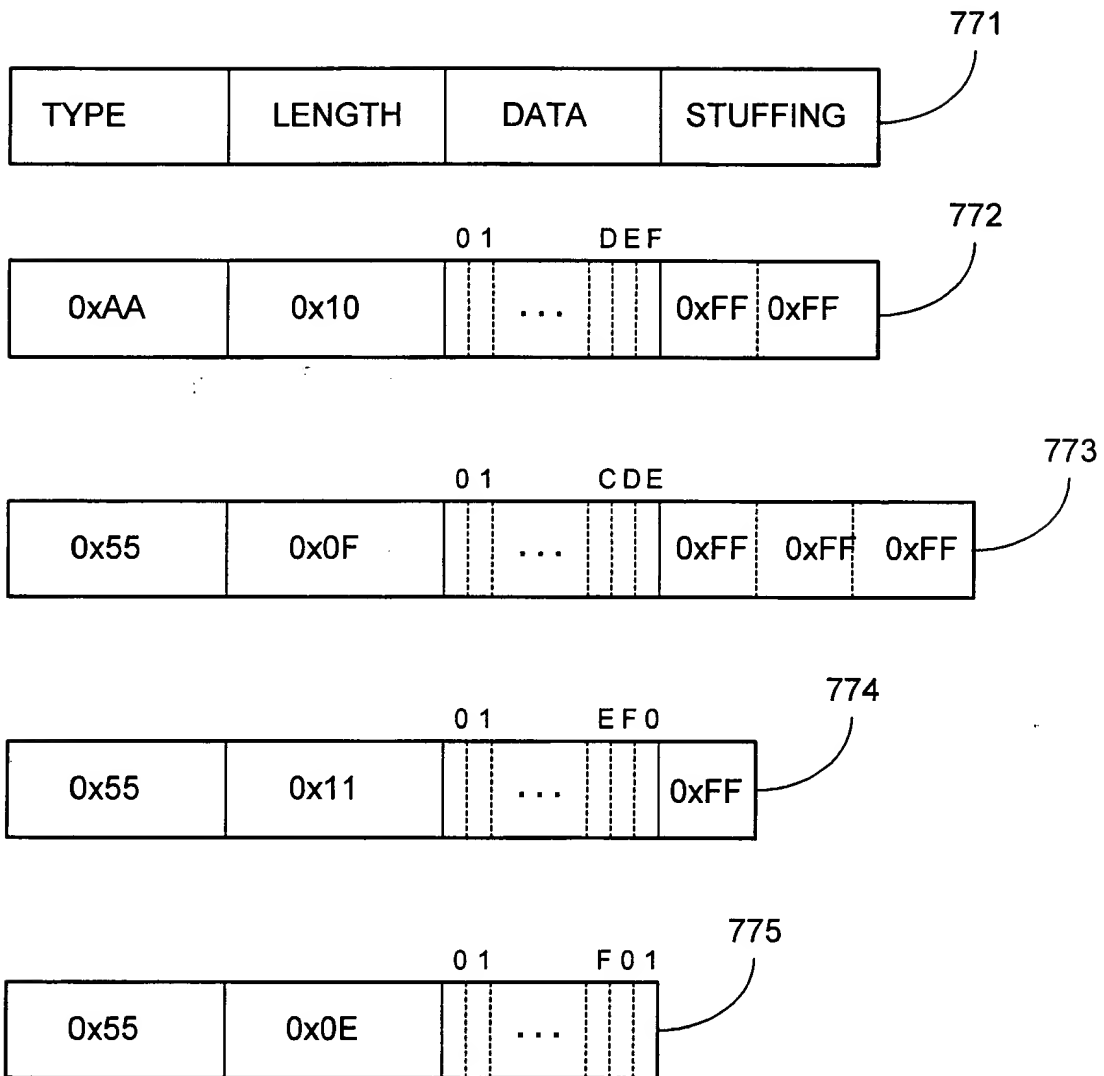


Figure 34

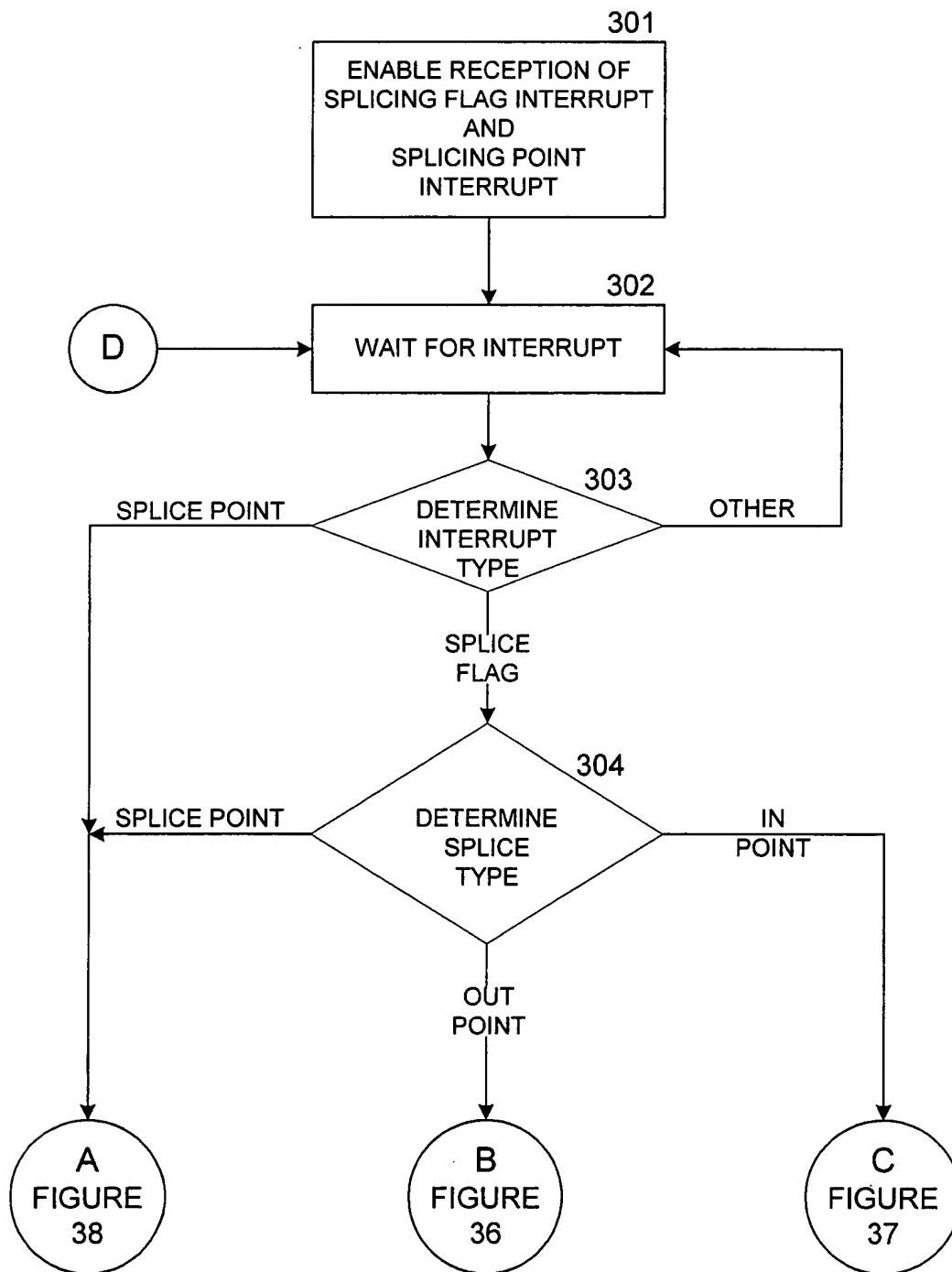


FIGURE 35

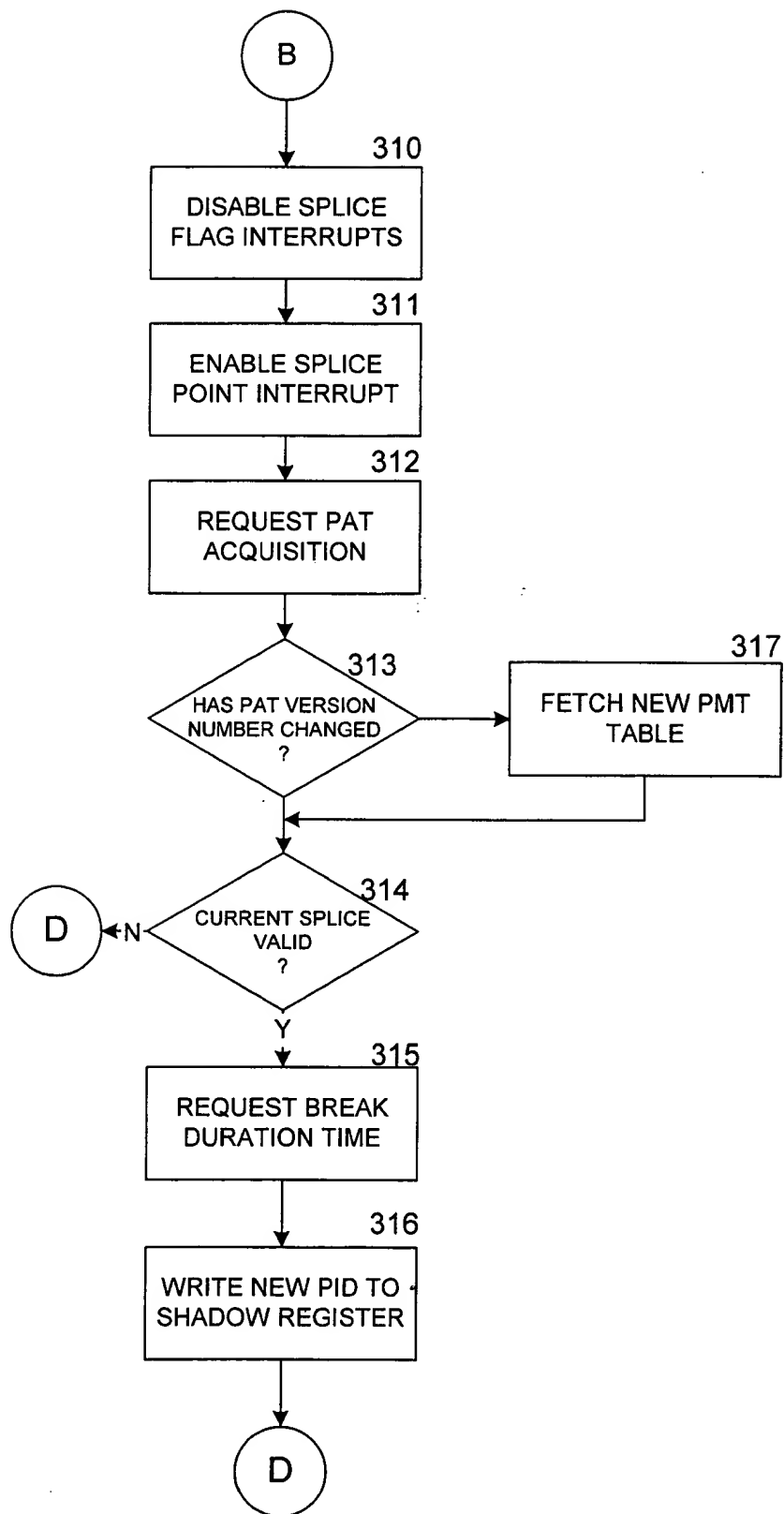


FIGURE 36

```

graph TD
    C((C)) --> 336{FIRST INPOINT  
ISR REQUEST  
?}
    336 -- N --> D1((D))
    336 -- Y --> 337{VALID INPOINT  
?}
    337 -- N --> D2((D))
    337 -- Y --> 338[REQUEST PMT  
ACQUISITION]
    338 --> 339{PCR AND PIDS  
OK  
?}
    339 -- Y --> D3((D))
    339 -- N --> 340[UPDATE PIDS]
    340 --> D4((D))

```

FIGURE 37

A

331

TRANSFER PID FROM
SHADOW REGISTER
TO ACTIVE REGISTER

332

REQUEST UPDATE OF
THE STC COUNTER

333

ENABLE SPLICE FLAG
INTERUPT

D

FIGURE 38

```

graph TD
    START([START]) --> 911[INITIALIZE  
CHARACTERISTIC  
VARIABLES  
FIGURE 40]
    911 --> 912[EXECUTE VERIFICATION  
ROUTINE  
FIGURE 41]
    912 --> 913{VERIFICATION  
SUCCESSFUL  
?}
    913 -- YES --> 914[CLEANUP]
    913 -- NO --> 915[INCREMENT  
CHARACTERISTIC  
VARIABLES  
FIGURE 42]
    915 --> 916{SUCCESSFUL  
?}
    916 -- YES --> 912
    916 -- NO --> 914
    914 --> END([END])
  
```

FIGURE 39

START

921

T_ERROR_POLARITY = 0 {0,1}
T_START_POLARITY = 0 {0,1}
T_VALID_POLARITY = 0 {0,1}
BIT_ORDER = LSB {LSB,MSB}
CLOCK_POLARITY = 0 {0,1}

922

T_ERROR_POLARITY = 0 {0,1}
T_START_POLARITY = 0 {0,1}
T_VALID_POLARITY = 0 {0,1}
BIT_ORDER = LSB {LSB,MSB}
CLOCK_POLARITY = 0 {0,1}

END

FIGURE 40

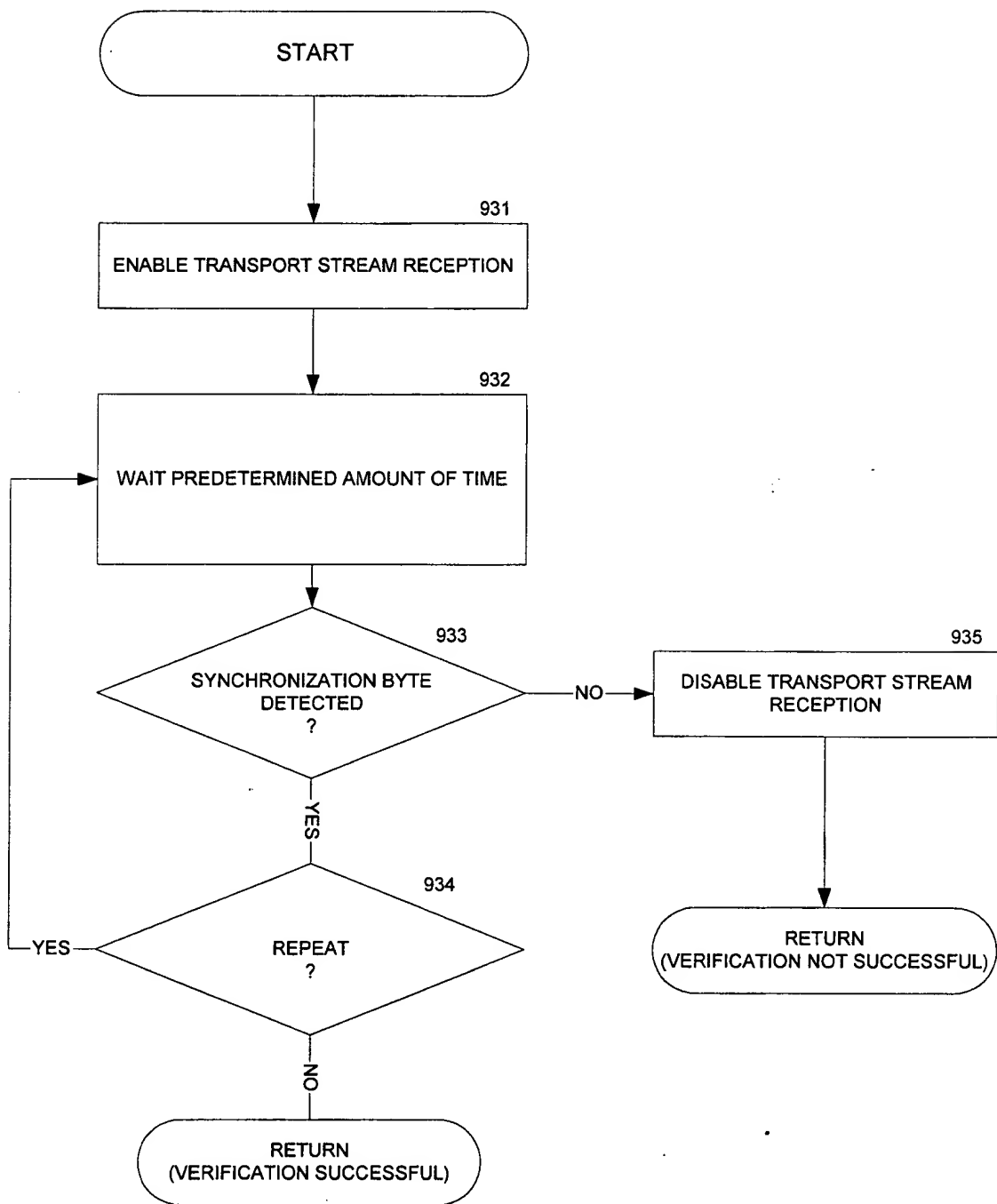


FIGURE 41

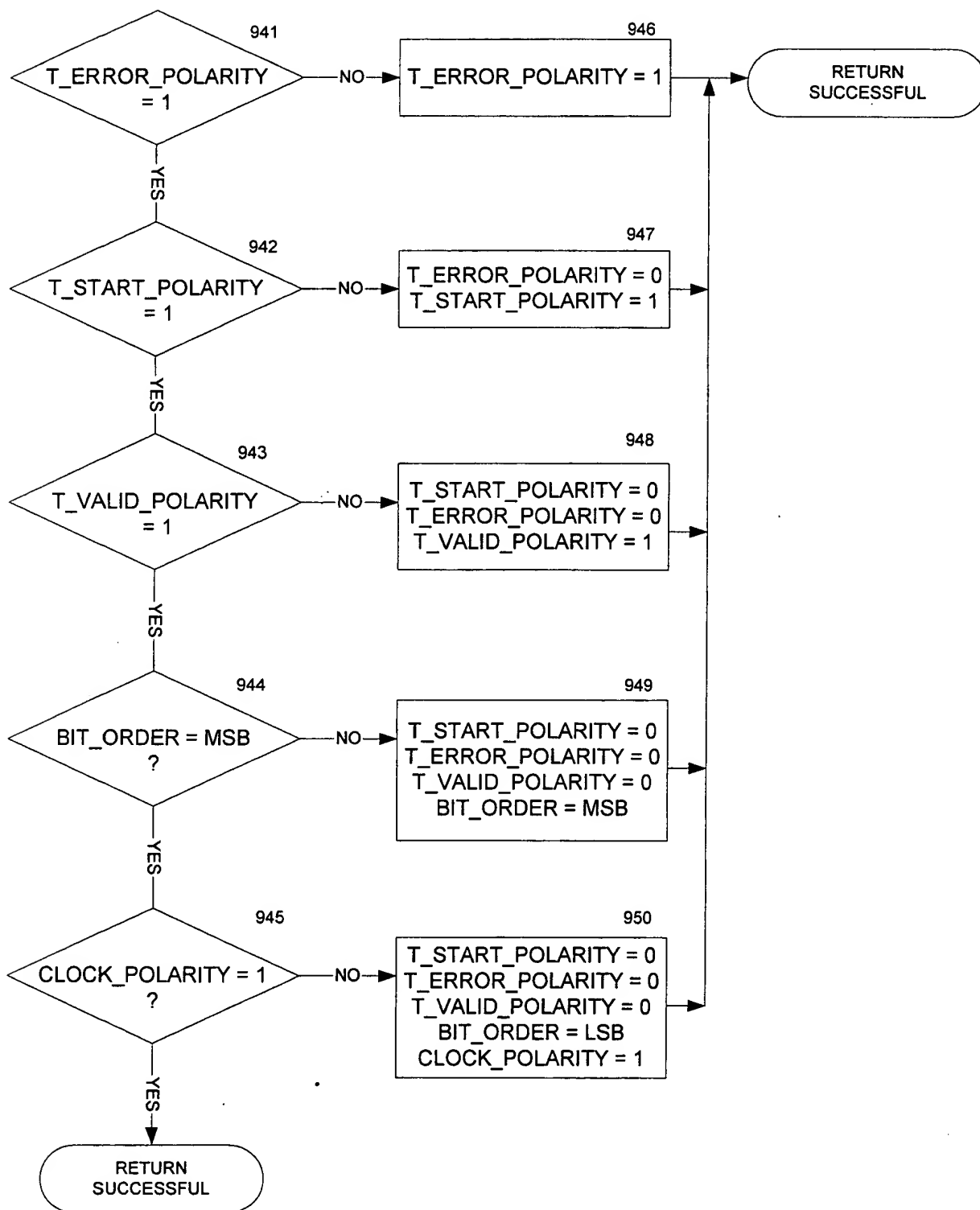


FIGURE 42

[illegible]

**FIGURE 44**

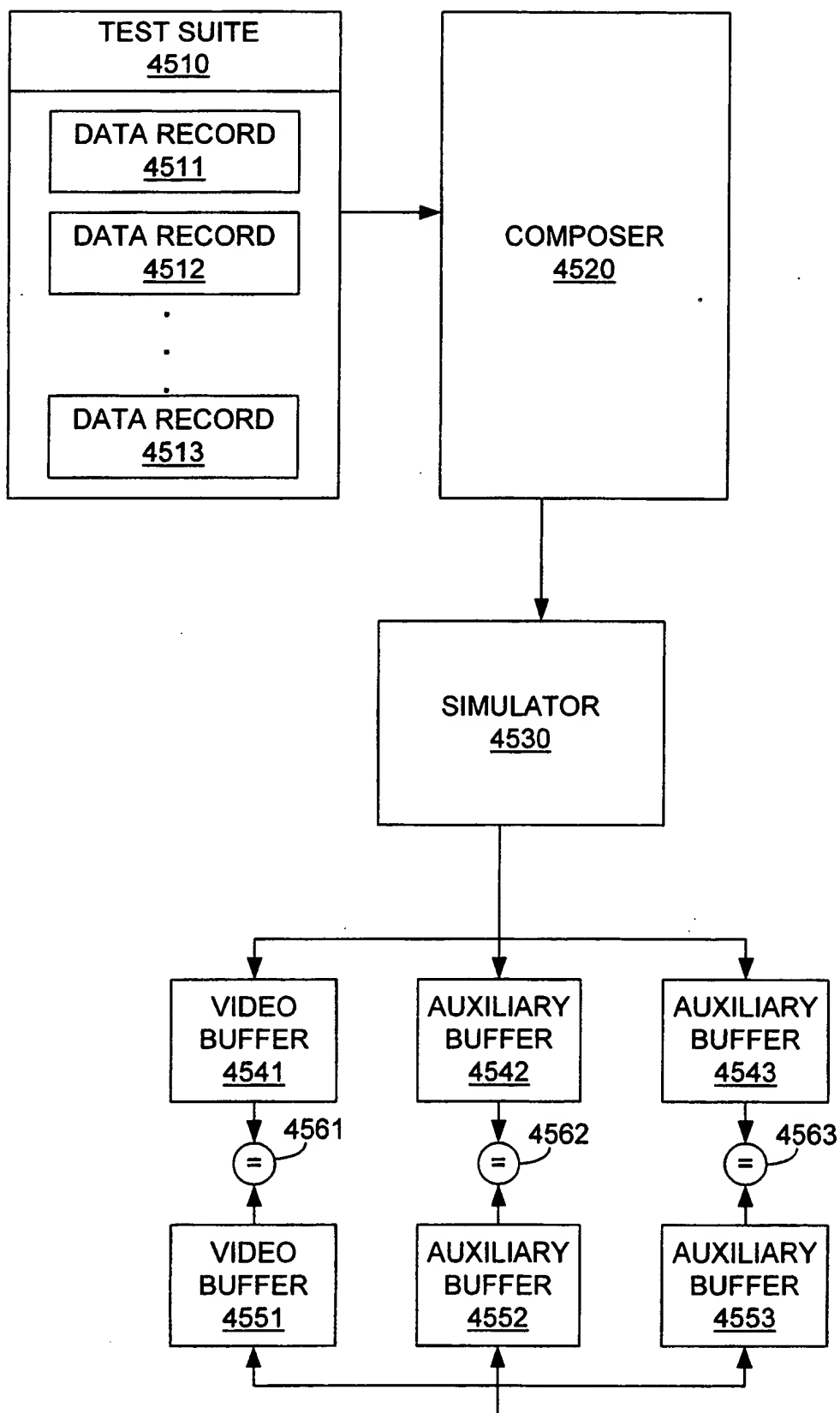


FIGURE 45

FROM DEVICE
UNDER TEST

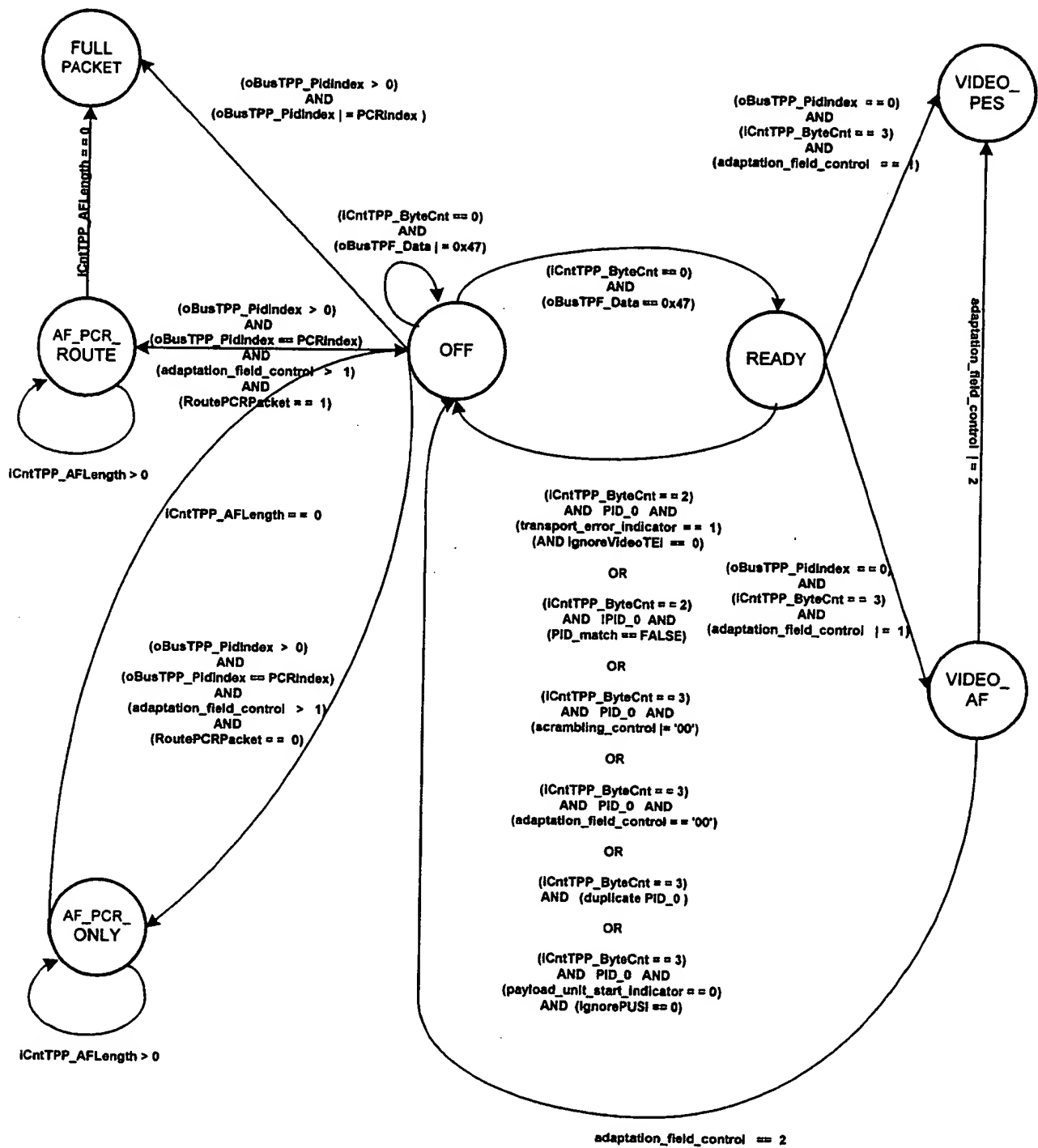


FIGURE 46

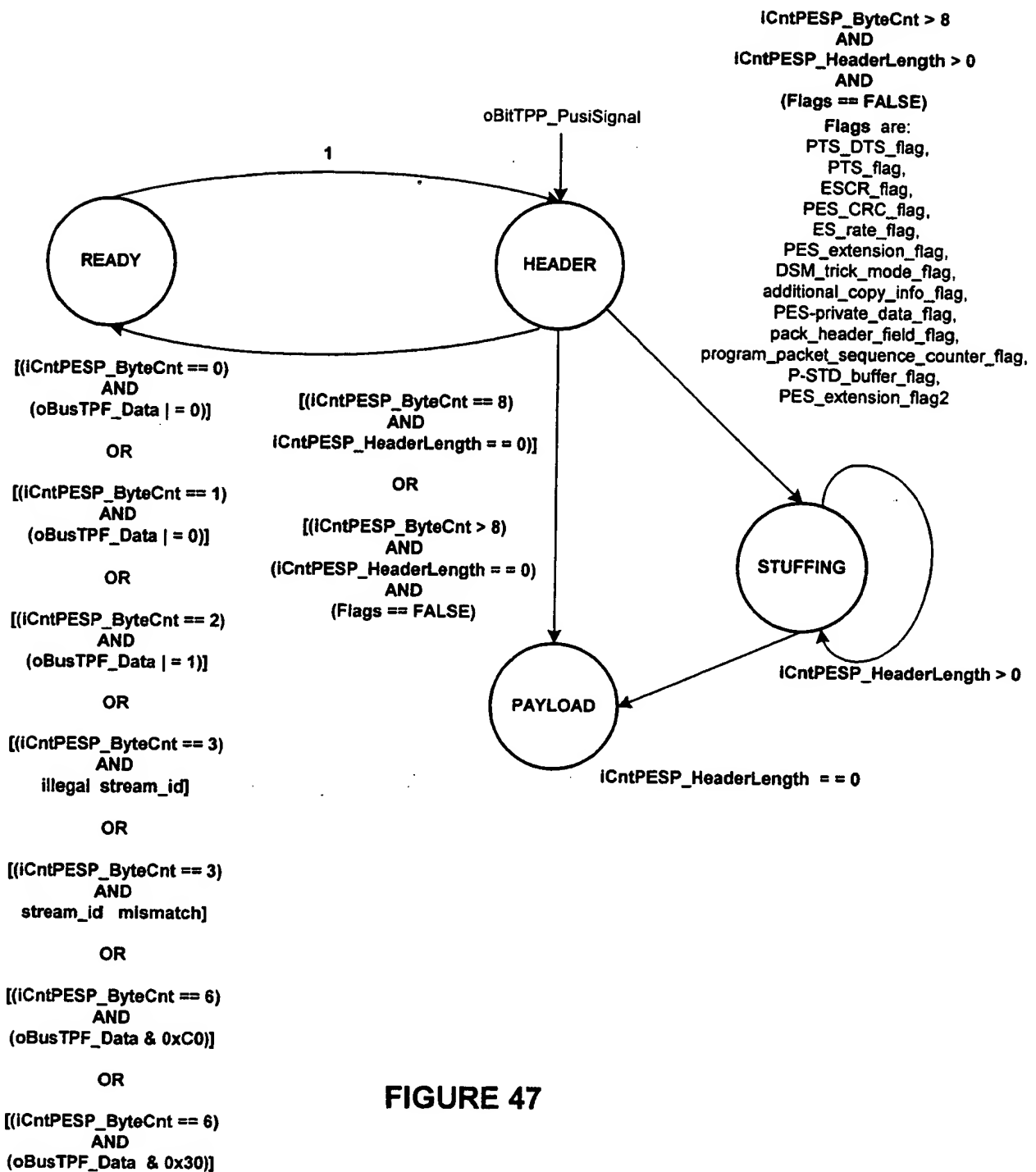


FIGURE 47

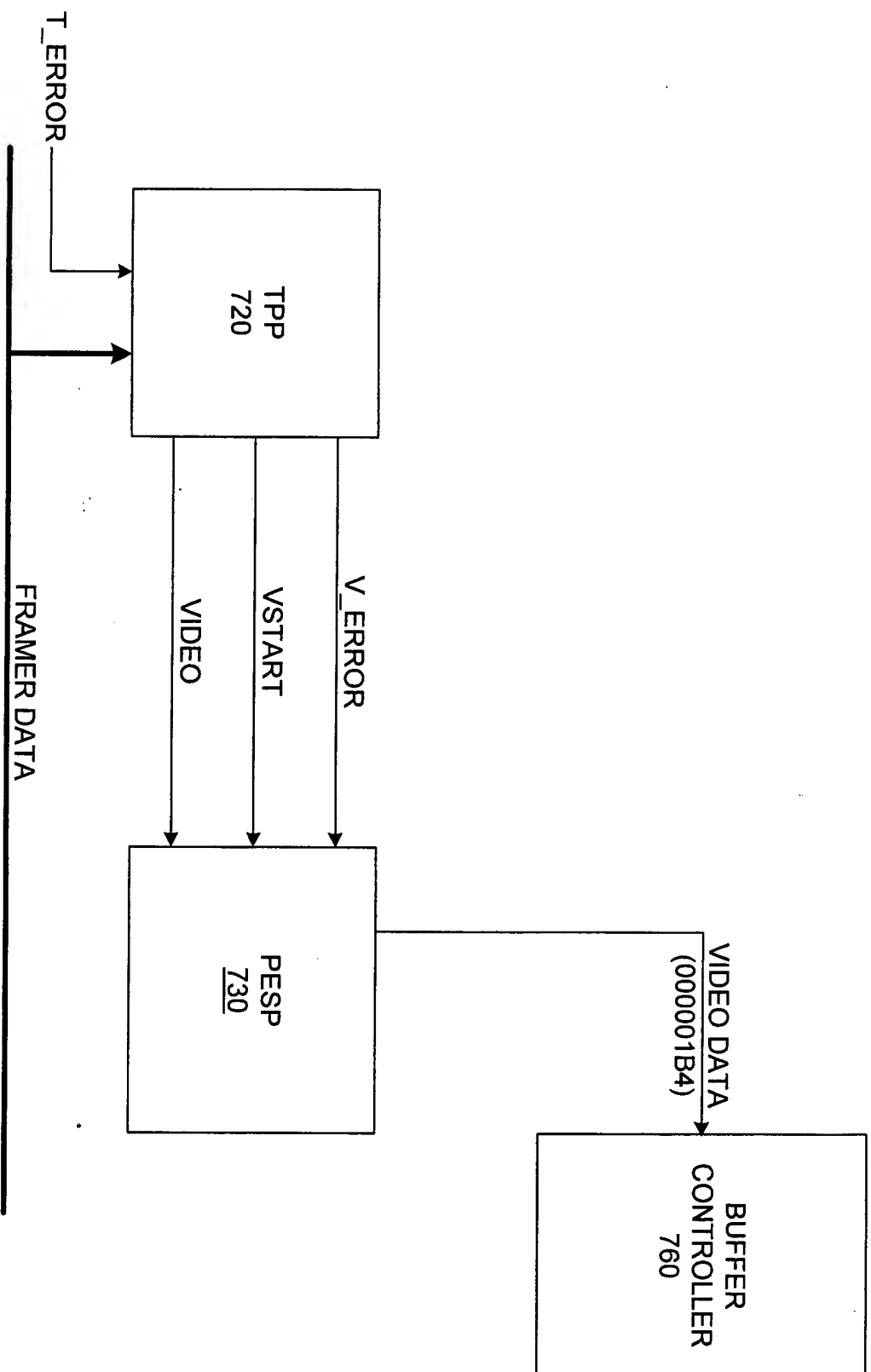


FIGURE 48

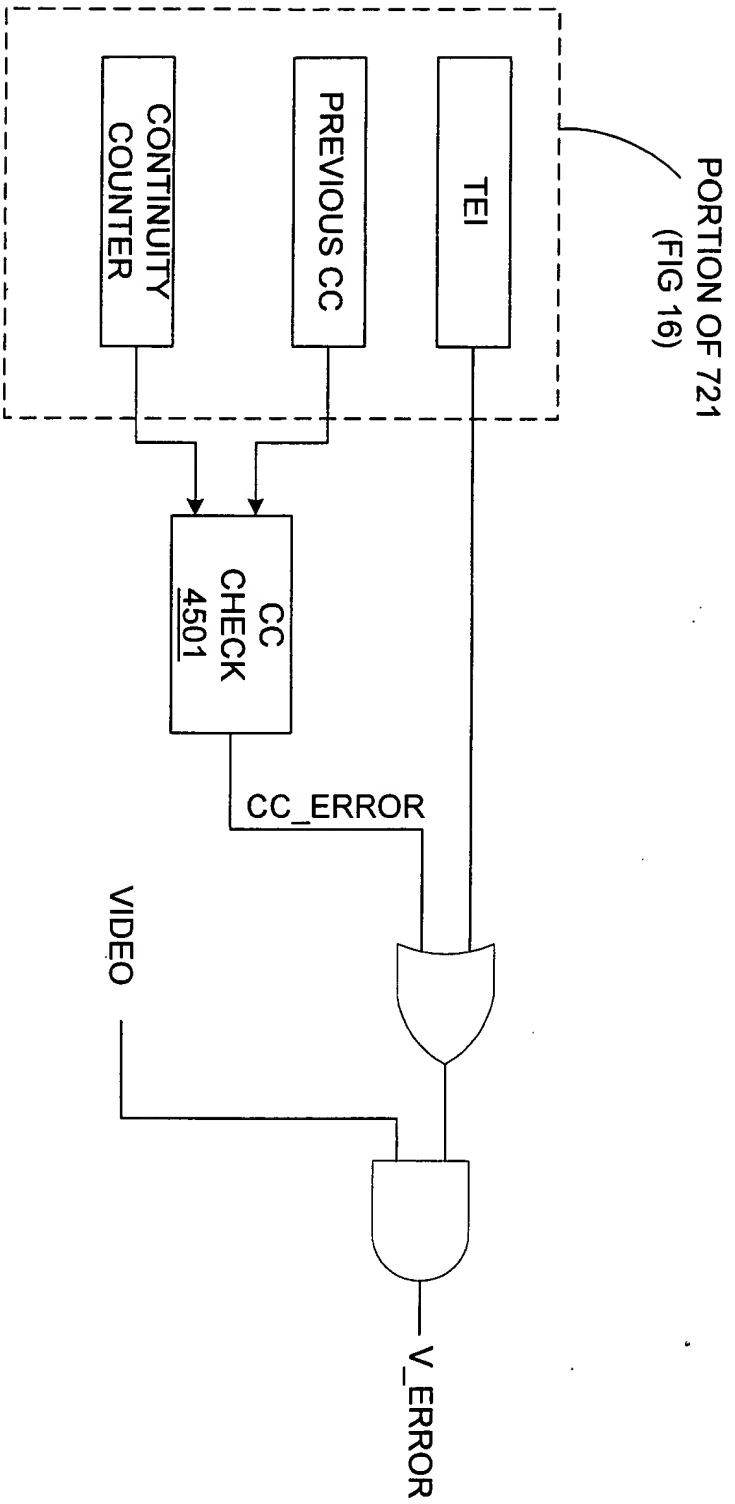


FIGURE 49

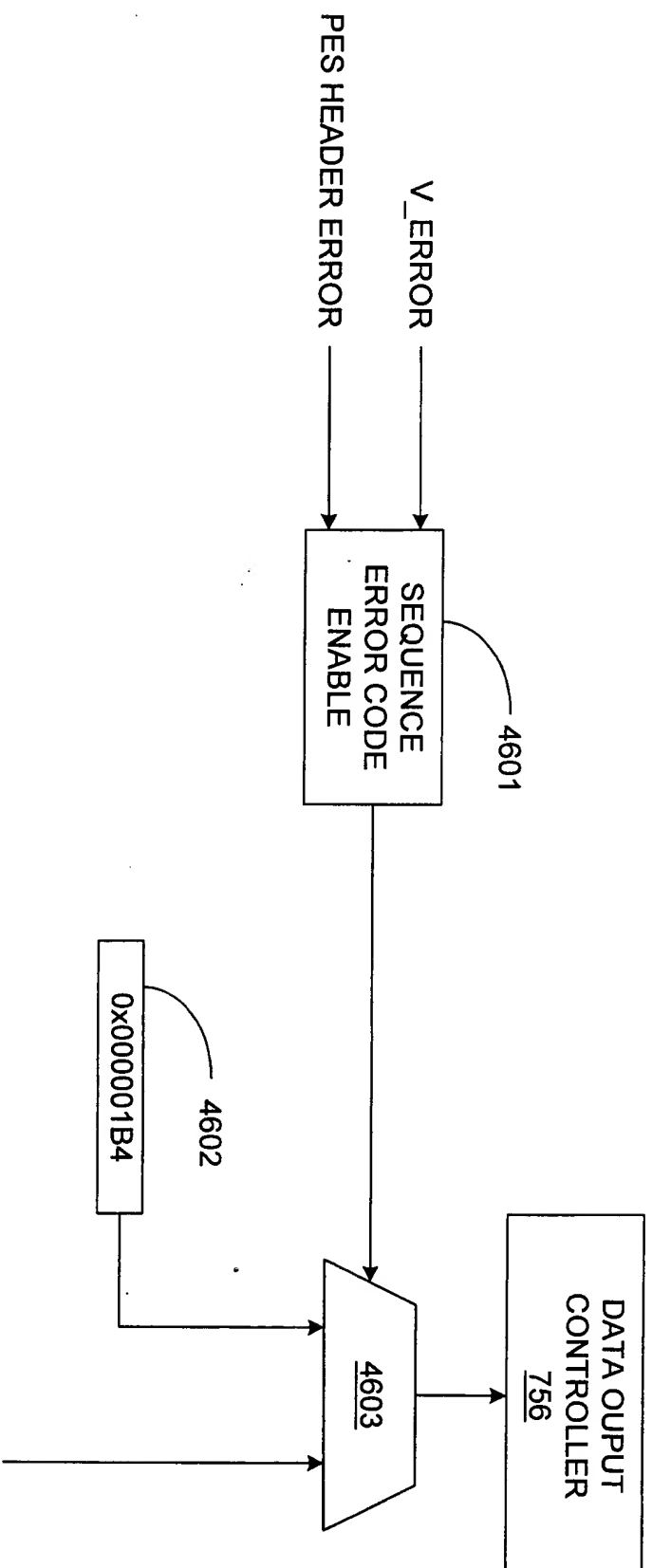


FIGURE 50

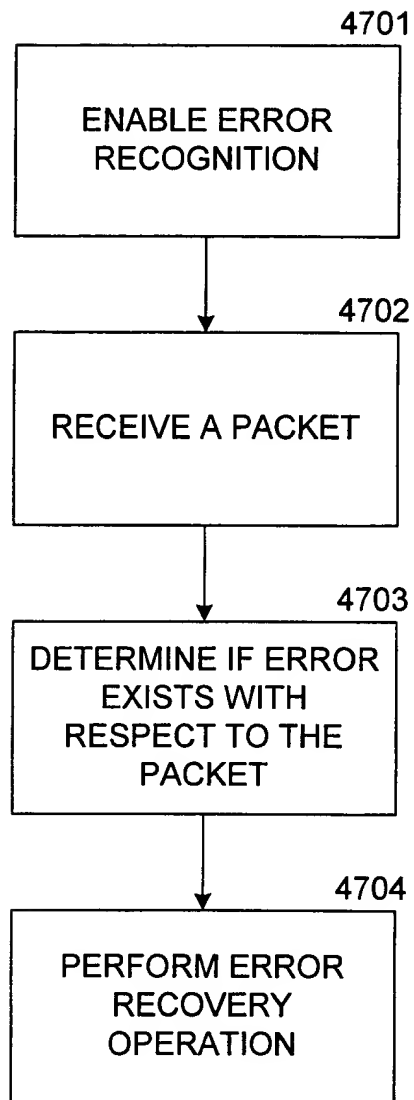


FIGURE 51

Transport Demultiplexer Interrupt Mask Register					
Field Name	Bits	Len	Default	Type	Description
EventInterruptMask	0-18	[19]	0	R/W	If set to '1' enables local sources of interrupts. Bit 2 – VideoTransportPacketError Bit 3 – VideoTEIError Bit 4 – VideoCCError Bit 13 – VideoPESHeaderError Bit 14 – VideoPESDataAlignment Bit 17 – VideoPESCRCErr
Transport Demultiplexer Video PID Control Register					
Field Name	Bits	Len	Default	Type	Description
IgnorePESHeaderError	25	[1]	0	R/W	If set to '1', when PESP detects error on PES header, (on bytes 3 and 6) header parsing continues. If set to '1', when PESP detects error on PES header, header parsing stops and no PES payload is sent to video FIFO until a new PES header start code is found
InsertSEConPESHeaderError	26	[1]	0	R/W	If set to '1', when PESP detects error on PES header, a 4 byte seq_err_code is sent to video FIFO.
DropTPIfScrambled	27	[1]	1	R/W	If set to '1' scrambled video TP is dropped.
DropPESIfScrambled	28	[1]	1	R/W	If set to '1' scrambled video PES packet is dropped.
IgnoreVideoTEI	29	[1]	0	R/W	'0' rejects of ALL video packets with TEI bit set. '1' enables parsing of ALL video TPs with TEI error.
InsertSEConTEIError	30	[1]	0	R/W	If InsertSEConTEIError == 1 when TEI error is found a 4 byte seq_err_code is inserted in the video buffer.
InsertSEConCCError	31	[1]	0	R/W	TPs with CC error are always processed. If set to '1' a 4 byte seq_err_code is inserted in the video buffer.
Transport Demultiplexer Global Status Register					
Field Name	Bits	Len	Default	Type	Description
VideoTransportPacketError	2	[1]	0	R/W	This bit is set to '1' after a transport packet of the selected video PID has wrong content in the header. WR_ACC_CLEAR.
VideoTEIError	3	[1]	0	R/W	This bit is set to '1' if video PID contains transport_error_indicator asserted. WR_ACC_CLEAR.
VideoCCError	4	[1]	0	R/W	This bit is set to '1' if video PID has discontinuity on continuity_counter field. WR_ACC_CLEAR.
VideoPESHeaderError	13	[1]	0	R/W	This bit is set to '1' after an error in the PES header is found. WR_ACC_CLEAR.

FIUGRE 52

Transport Demultiplexer TEI Count Register					
Field Name	Bits	Len	Default	Type	Description
TEIErrorCount	0 - 31	[32]	0	R/W	Gives the current TEI error count on video PID.
Transport Demultiplexer Transport CC Error Count Register					
CCErrorCount	0 - 31	[32]	0	R/W	Gives the current CC error count on video PID.
Transport Demultiplexer Transport Packet Count Register					
TPPacketCount	0 - 31	[32]	0	R/W	Gives the current number of parsed transport packets on video PID.
Transport Demultiplexer PES Byte Count Register					
CurrentPESByteCount	0-15	[16]	0x0000	R	Current number of parsed bytes from PES packet.
CurrentPESPacketLength	16-31	[16]	0x0000	R	PES packet length from the current PES packet.
Transport Demultiplexer PES TEI Count Register					
TEILatchedPESByteCount	0-15	[16]	0x0000	R/W	Number of parsed bytes from PES packet at the time of TEI error.
Transport Demultiplexer PES CCERR Count Register					
CCLatchedPESByteCount	0-15	[16]	0x0000	R/W	Number of parsed bytes from PES packet at the time of CC error.
Transport Demultiplexer Video PES Packet Register					
PESCRCErrCount	24-31	[8]	0x00	R	PES packet CRC error count from the last reading. This is obtained from internal CRC checker of video PES payload data.

FIGURE 53